RAILROAD GAZETTE

FRIDAY, DECEMBER 19.

## Contributions.

### The Earliest Dining Cars.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Replying to your recent inquiry, the Philadelphia, Wilmington & Baltimore Railroad did run two dining cars, between Philadelphia and Baltimore, for about three years, commencing some time during 1863. These cars were originally 50-ft. coaches, and were remodeled with a partition running through the center, crosswise, one end being used for smokers, and the other as an eating bar, fitted with steam box and other fixtures usually found in a first-class restaurant. Each of these cars made a round trip daily. The articles served were prepared at the terminal stations, and placed in the steam-box before starting. The bill of fare was similar to that ordinarily found in good city restaurants. When these cars were broken up, they were not replaced in the equipment.

H. F. KENNEY,
General Superintendent P., W. & B. R. R.

[The above letter was received among the responses to an inquiry as to where and when dining cars were first introduced, and gives, so far as now appears, the earliest instance in which anything resembling the modern dining car was run. Their next appearance seems to have been some years later on one of the Chicago roads, but as to which one it was, out of several which adopted them about the same time, we have no precise information.—EDITOR RAILROAD GAZETTE.]

### Measuring Water Evaporated by Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I noticed some time ago an editorial article in the *Railroad Gazette* on fuel accounting and economy, and it occurred to me that a cheap and effective check upon the economy of the fuel consumption might be obtained on small roads by measuring the water evaporated by each engine with a water-meter, while on larger lines, which keep records of individual coal supply to engines, the two records combined, that is, water evaporated and pounds of coal consumed, would be a most valuable check. That some one of the many water meters in use could be made self-registering and reliable I have little doubt. The advantage over keeping record of coal burned only would be in labor employed, and also in the fact that reports for summer and winter could be compared one with the other without deductions for radiation. With the two records combined, defects in coal, flues, exhaust, etc., would become evident at a glance.

W. C. W.

[There can be no doubt that if a small meter were fitted to every tender, as suggested, in such manner that all water drawn to the boiler passed through it, it would, if it worked satisfactorily, furnish information which might easily be made of great value, especially for easy comparison of various fuels with each other, and to some extent for comparisons between different roads. A difficulty—besides that of procuring a sufficiently good and cheap meter, which is probably not great—would be that an apparently large evaporation may either be genuine or may arise from the very bad fault of carrying over an excessive amount of unevaporated water with the steam, so that without tests for this water in suspension, more or less of which is always carried over by the steam, no positive conclusions as to the efficiency of the boiler could be drawn. Still, such a record ought certainly to have its value and is so easily provided for that it will be surprising if it has not been attempted.—EDITOR RAILROAD GAZETTE.]

### Locating on Maps and in the Field.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the *Gazette* of Dec. 12, in an article signed C. R. Wise, headed "Maps of Railroad Surveys," I note with some interest his comments on "Sad failures in the location of lines through difficult countries by a practiced eye," and that he advocated paper locations from contours as being the best and cheapest.

As it is a rare occurrence that I resort to the pen, I answer this with some hesitancy; but I have spent nearly 20 years as a locating and constructing engineer, and during my entire experience, I have never come in contact with a single locating engineer, who was prominent, who was not a born engineer. Nor have I ever seen a location made by contour in an office that was worth the cost of the map; unless made by the same engineer who did the field work, and was fully and thoroughly informed of every change in the ground from personal knowledge; nor have I ever seen a railway map which was *exact* and perfectly accurate in all its details, in the topography, unless that map had been prepared after the final location, or had been worked up at a loss of time and an expense which no railway manager, who considers the interest of the stockholders and his own reputation, will even allow. It has frequently been my experience to see a Chief Engineer or General Manager attempt to change and improve a location in his office. I admit that certain improvements are made in this way; but if the same man could see his ground and the line as located, he could save $1,000 in the field where he will save $100 in his office.

An engineer who is a natural locator, is capable of doing three times the work at one-half the cost that the same work will cost if done in the office, and where from five to eight miles of location are being made by one party each day, there is no topographer living who can prepare an accurate map from which the very best results can be obtained by making an office location.

We have reached an age when railway companies want fast, cheap, and accurate work from their engineers. Although it only takes a few years of such a life to wear out an iron constitution, and although the engineer who by excessive work and exposure may earn the company hundreds of thousands of dollars, is expected to work eighteen hours per day on a salary that is barely enough to feed and clothe his family and himself.

For the life of me, I cannot understand why it is a disadvantage to possess a practiced eye.

Assuming such to be the case, we must admit that an office lawyer is the best before a court, simply because he understands office duties; and, to repeat, I believe eight-tenths of the experienced engineers of this country will agree with me when I say *no man* ever became a competent locating engineer by making his locations from a map in his office. It is a rare occurrence to find a fast, cheap and accurate locating engineer. Many *engineers* can handle successfully construction work, who, if placed in charge of the location of a difficult line, will, in time and money, cost their companies from 1,000 to $10,000 per day. And it is equally true that not one railway manager in a hundred either detects or appreciates this fact.

Millions of dollars have been thrown away in this country by office locations.

OLIF.

### Automatic Car Couplers.

DENVER, Nov. 29, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

With what I have been enabled through the kindly use of your columns to say upon this subject, and in view of articles which I hope will yet appear, it has seemed to me that everything had been said that I could say.

In my last *Gazette* (Nov. 21) appears a communication over the *nom de plume* of "Standard Coupler," having reference to mine of Nov. 7.

If it were not for the opportunity it gives me of correcting some misapprehensions (due to a want of explicitness on my part) in your editorial of the same date, wherein you refer to our several letters, I would abstain from noticing "Standard Coupler's" criticism on the score of its being anonymous.

Having concluded to give it some attention, I will take it up by paragraphs as it appears in the *Gazette*.

1. The gentleman assumes that I imply there "should be no standard coupler at any time," any more than there should be a standard locomotive. This is a distortion of my language that the facts in no manner warrant. There was nothing said as to the desirability or otherwise of ultimately reaching that condition of things; but as there was not then, is not now, and possibly will not be, any visible power competent to establishing this "standard" and enforce compliance therewith, it seemed to me an indefinite postponement of the question.

The difficulty seems to be that "Standard Coupler" and others are dead set upon confounding *standard* with *opinion* or *recommendation*. We all know what a standard pound, yard and gallon means, for the reason that they are established by statute or public opinion, from which there is no dissent, and have a power of compulsion back of them enforcing a compliance with their requirements. But when a voluntary association of men call any mechanical device a "standard," it is nothing more than an opinion, valuable or otherwise as future use and application may determine.

As to my coupling locomotives with other things, which "Standard Coupler" regards as dissimilar in conditions, to the extent of wondering that any one can see any comparison, I beg to say that the comparison is close, and that the difference is one of degree and not of kind. One of our roads rented of another a few years ago five locomotives and kept them for a year. Our most important line as to mileage has leased locomotives for years and does still by the score. When the lease expires, if not purchased, they will probably go elsewhere.

Another of our roads has four different kinds of freight engines. Now, as your correspondent is on "standard" business bent, if it were possible, would it not be a benefit in this case, as well as in car-couplers or anything else? Hence the error our incognito has fallen into by ignoring things the existence of which happen to be beyond the narrow limits of his geography.

2. As to the question, "Is there any reason why there should not be a coupler adopted which shall be perfectly interchangeable." Certainly not; but every reason why that important requirement should be insisted upon. It the gentleman will refer to requirements 2 and 3 in my letter of Nov. 7, he will be fully answered.

3. The word "now" quoted here is used in a sense different from that intended in my paper. I did not mean it to have any reference or bearing upon the draw-bars now in use. I should have said, perhaps, "that any standard adopted at this time in accordance with the answers given questions asked by the New England Railway Club will not," etc., etc. As to what is said in the closing sentences of this paragraph, however desirable the end may be, the "practicability" is not obvious, for reasons heretofore given.

4. The roads constituting the mileage referred to are not in bad condition; rather the reverse. The curvature is what might be called excessive; 24-degree curves are frequent and 30-degree not altogether absent.

5. "Standard Coupler" wants to know how I feel justified in declaring that the answers to Question 3 of the New England Railroad Club of Sept. 24 are "erroneous and misleading." I can use no clearer language than that of my letter of Nov. 7, except to say in addition thereto that it was neither an opinion nor assertion merely, but a reliable statement based upon facts. In view of the importance of the question (3) and the (to me) evident absurdity of the answers given I felt constrained, much against the stomach of my sense, to mention a coupler by name, so that in case of question a demonstration could be had. *Facts* cannot be strengthened or weakened by counting noses, as "Standard Coupler" seems to think.

6. "In the treatment of question 11 (of the Club), there is shown a great lack of explicit clearness." So says "Standard Coupler," referring to my article of Nov. 7. What the Legislature of Massachusetts has done as referred to by me and as to which your correspondent seems to coincide, is, I beg to say, reasonable, practical and desirable, and if properly worded will in all probability be enforced by the courts in a manner to exact obedience. But when he says the Legislature "can also say to the railroads that unless some device is used to prevent accidents you must stop running your trains," I think he is greatly mistaken. Such enactments are not enforced by the courts of civilized countries, therefore are impracticable. If "Standard Coupler" consults a lawyer on this matter he will probably think that legislatures and courts are also in want of what he calls a "Standard."

7. "It is conceded by all, except Mr. Evans, that the danger of coupling cars is almost wholly due to inequalities in height and shapes of draw-bars; or, in other words, to the want of standards." So says your correspondent. At the risk of running counter to what he calls the "horse sense of an ordinary mechanic" (whatever that may be), I beg to say that this is not the case. The great majority of accidents are caused by the necessity of going between the cars to handle the link while they are in motion; a necessity which the equal height of draw-bars does not obviate and which has been largely increased since the adoption of what some call a "standard" link. Who first christened it so I cannot say positively, but as your correspondent seems to be in the "standard" business largely, he may furnish the information.

8 and 9. As to these, there is not much to be said of practical value, with the exception that their bias is based upon the supposition that knowledge of things is largely if not entirely confined to particular classes. The yard-masters would be no choice of mine, nor the car-builders; for I have said, and repeat it again, the matter is beyond the capacity of either. As to the matter of the time "when mechanics are employed to run trains and train-men to build them," this would be expensive and also disastrous. Still, as a modifying fact, I would remind the gentleman of that poor boy who was engaged in keeping up steam in his stationary engine at 12 shillings per week, who found time to elaborate that which has revolutionized business. He must have "wilted" the horse sense of the ordinary mechanic of the period in a most alarming manner.

10. Quoting from "Standard Coupler," "If it were worth while to enter into a detailed statement of the expenses of maintaining the link and pin, it might be attempted, but it is not." Now such assumptions are born of professional egotism and prejudice, and whoever indulges in them would probably have said to poor George Stephenson, "You are crazy; you are nothing but a stoker; there is an association of wagon makers who have 'horse sense,' and are supposed to know and do know all there is to be known as to this matter."

The value of the link I regard as *one* of the most important things connected with this coupler question at the present time, and not to be dissipated by a grandiose wave of the hand, for the following reasons:

1. The use of links for freight cars is practically universal over the world.

2. Many roads are incapable of dispensing with them at present, if ever.

3. The expense in the way of loss can be reduced to practically nothing without cost to the roads, by a simple system of accounting.

4. No reasonable comparison can be made between devices without a knowledge of the cost of links and pins lost and broken.

As an illustration, two automatic couplers are presented for comparison and tests. One has no loose parts, the other requires a loose link. We will admit they are equally effective in every way and under all circumstances. The cost of the first is $7; of the latter, $10. Now as the only objection to the link is this matter of cost of the lost, will not people possessed of sense (not the kind referred to by your correspondent, but the common sort) seek to know which of these two devices, upon economical grounds, it would be policy to adopt? And is not this information valuable, not to me personally in particular, but to all? How can a conclusion be arrived at without knowing the cost or value of the loose part or parts.

To assume that, because there is a loss, whether exaggerated or not, arising from the use of a coupler having a loose link, it is not deserving of examination, notwithstanding it may have merit overbalancing that defect, if defect it be, is

pure and unadulterated prejudice, and those who indulge in it are totally unfitted to set up even a so-called "standard."

11. And questions pertaining thereto. For answer, I respectfully refer "Standard Coupler" to the requirements 1 to 4 inclusive in my article in the *Gazette* of Nov. 7.

12. I quote: "The action of a vigorous imagination may see the fulfillment of the requirements prescribed by Mr. Evans, but," etc. It can be seen now, and, strange to say, the device has been on exhibition in the rooms of the Master Car-Builders' Club, Liberty street, New York city, for nearly two years. I saw it there myself, set up and mounted, in April last, very much in the way, for the quarters are somewhat contracted and the device bulky. It will fill all the requirements from 1 to 10 mentioned in my letter of Nov. 7. As your correspondent offers his influence to secure patronage for such a device, I beg to refer him to Mr. T. B. Buchanan, of this place, who is financially interested in its introduction, and who informs me that he will gladly furnish drawings and description to "Standard Coupler" whenever he sees fit to come out of the tall grass in which he is at present concealed.

I wish to say as to my requirement No. 4 of my letter of Nov. 7, referred to in your editorial columns, for explicitness, there should have been added the words, "that will couple with draw-bars now in use." Of course it never occurred to me that any device would be adopted that failed to do so; and I said in my paper, without perhaps using the precise language, that devices failing in this particular would not be favorably received. As to the bumping of cars in the violent manner spoken of, the practice cannot be too severely censured; and employés should be made to suffer for indulgence in it. A coupler absolutely requiring that treatment should be at once discarded. The connection should be made in a perfectly effectual manner when cars are pushed together by hand, which is very convenient sometimes to do

In conclusion, lest I become subject to the charge of objecting to the manner of adopting so-called standards in the way proposed by some, without suggesting any remedy, I would refer to my article on "Tests." If carried out the following advantages would accrue:

1. Prejudice would have no weight.
2. Exhibitors would know what was required.
3. Examiners would know the value of devices.
4. It would be satisfactory to inventors.
5. The result of the tests would be tabulated, a certified copy given to all competitors, which would do away with the necessity of taking up the time of railroad officials.
6. A device once tested would require no further trial; the record once made would be sufficient.
7. It is possible that after a while it would result in a real standard.
8. The results would be based on absolute facts and not on the bare opinion of any *class*.

JAMES A. EVANS.

## The Mallinckrodt Brake.

The accompanying illustration, fig. 1, represents a novel form of brake especially adapted for freight service. The apparatus may be fitted to existing forms of either compressed air or vacuum brakes. Stated simply, the principle of the brake is that the weight of the car tends to apply the brakes, and the pressure in the brake cylinders keeps the brakes off. The force with which the brakes can be applied thus depends on the weight of the car, a condition which is of course valuable for a freight brake.

In the simplest form of the brake no triple valve or its equivalent is needed. The main pipe throughout the train communicates with each cylinder, and moves the piston and its connections in such a manner as partly to sustain the weight of the car. The escape of air from any cause permits the weight of the car to act on the brake levers and apply the brake.

This will be made clear by an inspection of fig. 1. The rod in the upper right-hand corner of the cut is connected to the brake piston, and the consequent tension on this rod keeps the brake off, and sustains part of the weight of the car. This rod is connected at *G* with a lever, which has a fixed fulcrum at *E*. At an intermediate point, a chain passing over a pulley *D* is connected to the centre of a spring plank, which is divided in the centre, the two halves being connected by a pin *B*. The spring plank is hung from the truck transoms by links and a pin *A*, and the weight of the car rests on the spring planks through ordinary bolster springs *H H*. It is evident that the weight of the car, which is transmitted by the bolster spring, is divided between the pin *A* and the pin *B*. The pin *B*, as before explained, is sustained in position by the pressure of air in the brake cylinder, which maintains a tension on the pull-rod, etc. When, however, the pressure in the cylinder is reduced, the weight of the car causes the lever *G F E* to move towards the left-hand side of the cut, and consequently apply the brake.

The brake can be released by hand by winding up the ordinary brake wheel, which takes the brake off instead of applying it. The brakes are applied by simply tripping the ordinary pawl of the brake-wheel rachet, when the weight of the car applies the brakes.

It is obvious that the full force with which the brake can be applied is limited by the weight of the car. The brake can of course be so proportioned that the pressure on the brake blocks can be fixed at any desirable proportion of the weight of the car. When therefore the brakes are applied with full force throughout the train, the pressure on the brake block will vary according to the weight of the car, a very valuable feature in a freight brake.

It will not, however, vary exactly as the weight on the wheels, as the greater part of the weight of the truck has no influence on the brake. The inventor's figures on this point are as follows:

"If we consider the efficiency of the brakes of a freight train composed of 50 cars, 25 of them empty and 25 loaded with 40,000 lbs. each, and assume the weight of the trucks at 12,000 lbs. and the car body at 10,000 lbs., and that the brake power is to be limited to 85 per cent. of the total

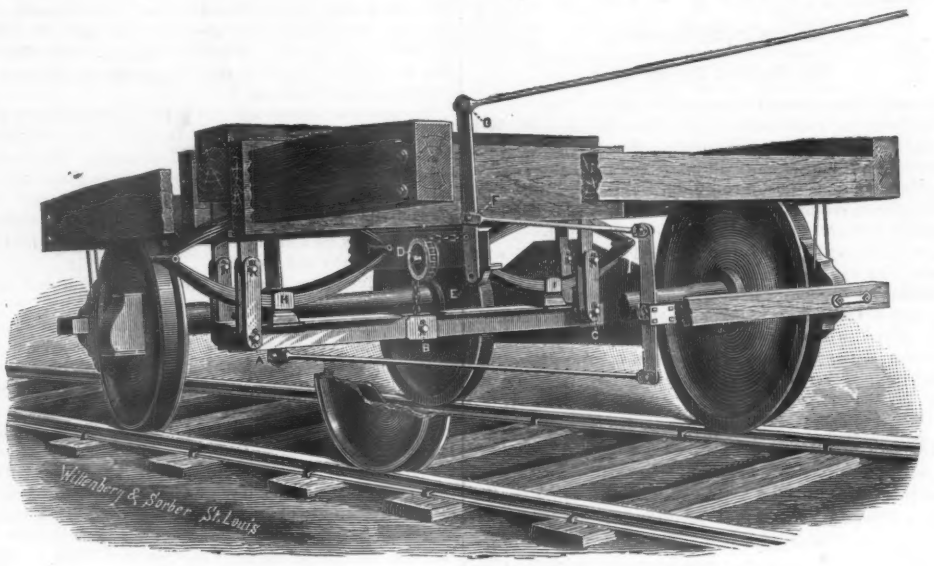


Fig. 1.

THE MALLINCKRODT BRAKE.

weight of the car, we obtain the following result from a comparison of the Mallinckrodt and other system of brakes: To prevent sliding, the pressure on the brake blocks should never exceed 85 per cent. of the weight on the rails. In the above case 85 per cent. of 62,000 lbs. is 52,700 lbs. per car. As this pressure is to be produced by 52,000 lbs. (the weight resting on the truck-), the ratio to be adopted would be on to one, and the maximum brake-block pressure would be:

| | |
|---|---|
| "On 25 empty cars (weight on trucks 10,000 lbs.).. | 250,000 lbs. |
| "On 25 loaded cars (weight on trucks 50,000 lbs.).. | 1,250,000 lbs. |
| "Total brake-block pressure..... | 1,500,000 lbs. |

"With ordinary systems the pressure must not exceed 85 per cent. of the total weight of an empty car, or 18,700 lbs. per car, and the total brake block pressure would, therefore, be:

| | | |
|---|---|---|
| "25 empty cars..... ..... | 18,700 lbs..... | 467,500 lbs. |
| "25 loaded cars... .... .... | 18,700 lbs.... .... .... | 467,500 lbs. |
| "Total brake pressure .. ..... ..... | | 935,000 lbs. |

"The Mallinckrodt brake would therefore have 58 per cent. greater efficiency."

In the form above described the Mallinckrodt brake has been in use on the Cincinnati, Washington & Baltimore

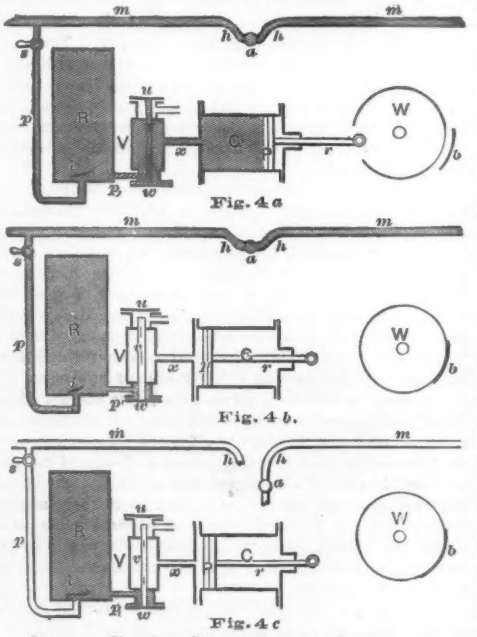


Diagram Showing Electro-Magnetic Attachments.

THE MALLINCKRODT BRAKE.

Railroad, formerly the Marietta & Cincinnati, and in a somewhat cruder form on some coal cars on the Denver, Utah & Pacific Railroad. It is stated that at some tests made on the former road a car was cut loose from a train running at 68 miles an hour down a grade of 79 ft. to the mile, and came to a full stop in 1,500 ft. In another test on the same grade, it is stated that the car came to a stand in 450 ft., the speed being 35 miles an hour.

Col. Henry Flad, of St Louis, who examined the action of this brake in 1882, has lately taken out some patents applicable to any air or vacuum brake, and calculated to increase the rapidity of their action on a long train of cars. We understand that the right to use the two sets of patents, 22 in number, has been acquired by the Mallinckrodt Brake Company, of St. Louis, which proposes to introduce a brake embodying these combined inventions, and having as its especial merits two unique features, intended to render it specially applicable to long freight trains: Mr. Mallinckrodt's invention, as explained, making the brake block pressure proportional to the weight of the car, and Col. Flad's making the application of the brakes on each car instantaneous and simultaneous on a long train. These are two extremely valuable features, especially if obtained without sacrificing the simplicity, convenience and efficiency of the brake in other directions.

It is almost unnecessary to add that electricity is the medium by which these results are attained. Wires are led through the train pipe and hose, the ends of the conductors on adjoining cars being brought into electrical contact when the hose is coupled in the ordinary manner. The hose on the last car is coupled to a dummy coupling which unites the two ends of the circuit, when two wires are used. The electric current is utilized to operate a species of triple valve. The piston and valve, etc., are, however, replaced by an electro-magnet and armature, working a valve which admits air to and releases it from the brake cylinder.

It will thus be seen that, to use a common phrase, the electric current has no great work to do. It has simply to make a small valve give the very minute opening necessary to admit air to an air-brake cylinder. Electricity, compressed air, and gravity each contribute their quota to the working of this brake. Electricity gives the communication throughout the train, and works the substitute for the triple valve which controls the application and release of the brake. The compressed air keeps the brakes off, and the power with which the brakes can be applied is only limited by the gravity of each car.

The addition of dynamos on the engine and electric conductor through the train pipe certainly introduces some additional complication, and so far increases the chances of failure; but, on the other hand, it is believed that it will confer a great advantage. As the substitute for a triple valve is worked by electric current and not by air, the auxiliary reservoirs can be recharged while the brake is on, thus avoiding any loss of pressure when running down long inclines.

The accompanying diagrams, figs. 4a, 4b and 4c, show the action of the Mallinckrodt brake fitted with the electro-magnetic apparatus. Various arrangements are proposed, but in this an auxiliary reservoir is used on each car. The air enters the auxiliary reservoir *R*, by the branch pipe *p*, through the check valve *i*, opening inwards. Another pipe *p'* connects the auxiliary reservoir with the lower compartment *w*, of the valve chamber *V*. The valve regulating the admission of air to the brake cylinder is connected to the armature of an electro-magnet, which armature is held up by a current of electricity. In this position the brakes are off. When the electric current is broken, either by the engineer, or in any other manner, the valve falls, opening a port in the upper part of the valve chamber *V*, and allowing the air in the cylinder to escape into the open air. At the same time the port connecting the cylinder with the lower part of the valve chamber *V*, and consequently with the supply of air in the auxiliary reservoir, is closed.

A provision can be made for working the brakes by "straigot" or non-automatic air should the electrical apparatus get out of order. A three-way cock can be substituted for the stop-cock *s*, and connected with a pipe to the cylinder, a stop-cock being placed on the pipe *x* which connects the central compartment of the valve chamber *V* with the brake cylinder. When the electro-magnetic apparatus was in use, the three-way cock would be set to communicate between the main pipe and the auxiliary reservoir, but when electricity was not used, the three-way cock would be set to open communication from the main pipe to the connecting pipe *p*, and through it to the brake cylinder.

Should the brake cylinder or valve chamber *V* be leaky or out of order, the whole brake on that car could be shut off by setting the cock *s* accordingly. The brake on the

car could then be kept off by winding up the hand-brake wheel, and applied by tripping the pawl, as before described.

The electrical attachments have been only recently patented, and are not yet in actual service. It will be observed that the brake is automatic. Should the train part, breakage of the electric circuit sets the brakes.

The bursting of a hose (without injury to the electric wires) would empty the main pipe, and the consequent loss of pressure would notify the engineer that the air had escaped. But, owing to the check valve, air would still be retained in each of the auxiliary reservoirs, and the engineer could consequently apply and release the brake possibly once or twice, but could not, of course, recharge the reservoirs until the hose was replaced.

When a car is cut out of a train and side-tracked, the effect of the breakage of the electric circuit would be to set the brake. We understand that this can be prevented by simply screwing the brake wheel up until it is tight and then securing it with the ordinary pawl and ratchet, the hand brake pull-rod taking the strain of the weight of the car and preventing the brake going on. This can be done with the least labor before the hose are separated. Once, however, the pawl is secured, the brakes cannot leak on, even though all the air may gradually escape.

We understand that the brake has also been patented in Great Britain, France, Germany and Austria, in all of which countries the battle of the brakes still continues, the Westinghouse automatic, the Carpenter automatic air brake, the Hardy, Sanders and various other forms of automatic and non-automatic vacuum brake and the Heberlein chain brake still vigorously contending for supremacy. Strange to say, some engineers in these countries are not satisfied with the choice offered them, and may therefore hail the advent of the brake which we now describe, which has certainly many novel and valuable features to recommend it. Any further information concerning it may be obtained of the Mallinckrodt Brake Co., St. Louis, Mo.

## Korting's Injectors.

The accompanying engravings illustrate some of the forms of Korting's injectors as manufactured by L. Schutte & Co., Philadelphia. Figs. 1, 2 and 3 represent the "universal injector," a form of lifting injector suitable for locomotive or other purposes. Figs. 1 and 2 show respectively an elevation and section of the same injector, and fig. 3 is an elevation of an injector made on a precisely similar principle, and having similar parts, but differently arranged in order to suit the standard arrangement of feed pipe connections, etc., used on the locomotives of the Pennsylvania Railroad. Figs. 4 and 5 show an injector specially adapted for washing out boilers or extinguishing fires.

The construction of the "universal injector" is clearly shown in fig. 2, and the method in which it is worked is as follows. The injector, as shown in the cut, is not at work. To start it the hand lever is moved slightly away from the injector, actuating a lever in the steam space. The centre of this lever is fulcrumed in a spindle attached to the hand lever, and the ends of the lever are attached to spindles connected with two mitre steam valves. The lower steam valve, being the smaller, opens when the lever is moved, the upper and larger steam-valve remaining closed by the pressure of steam. This small steam valve being thus opened, the steam passes through the small nozzle and tube into the central chamber of the injector, and thence out at the waste. As the handle is moved further, the rush of steam has sucked up some water, which is also discharged through the waste aperture in the same manner. But the handle is also connected to a slide piston valve at *B*, which, when moved, shuts off all communication between the central chamber of the injector and the waste. The further movement of the handle operates this valve by means of the side rod (seen in elevations figs. 1 and 3), which is connected to the spindle shown on the right-hand end of the injector in fig. 2. The slide valve having closed the passage from the central chamber to the waste, the mingled water and steam flows through the upper combining tube into the upper chamber *C*, and thence through the hollow piston valve *B*, past the mitre valve and out at the overflow. The continued movement of the handle has now opened the small lower steam valve to the fullest extent, and as it can go no further, owing to the collar on the spindle coming in contact with a stop, the large steam valve is now opened, and the steam is admitted direct to the larger combining tube. The escape from the waste is consequently quickened. The movement of the handle being continued, the steam valve is fully opened, and the mitre valve controlling the waste being simultaneously closed, the injector forces water through the check valve into the boiler.

The movement of the main handle has been described in its successive stages, but, under ordinary circumstances, no pauses are required in its movement, the handle being simply moved slowly until it is full open, and the injector is at work.

The amount of water which the injector will feed is controlled by the water valve, which is shown in section in fig. 2. The amount of feed can thus, it is claimed, be reduced to one-half the maximum amount.

The feed-valve handle controlling the water supply is combined with a spring catch which engages in notches in a sector, so that the valve can be set to remain in any required position giving the requisite amount of feed. After passing through the hollow plug which forms the water valve, the water enters a conical strainer composed of wire rings which arrest any chips, or pieces of dirt, which might choke the cones and interfere with the working of the injector. As the injector is preferably placed above the level of the water in the tender tank, the water valve need not be an absolutely tight shut-off valve, as when the steam valves are closed by the main handle the water has no tendency to enter the injector. The water valve is therefore simply designed to regulate the amount of water supplied to the injector. It is said that a No. 8 injector (the size illustrated) will (with all pipes 2 in. inside diameter) deliver as much as 2,000 gallons of water per hour.

The special advantages claimed for this injector are that the jet is not liable to be broken by shocks in switching, etc., and that this form will force the water of 150° Fahr. into a boiler, and lift it a considerable height from the level of the supply tank. It is also claimed that it can be practically worked wholly with one lever, the steam and water valves being practically self-contained, the steam and water stop valves remaining open while the engine is at work, and the injector being started and stopped solely by the hand lever.

It should be noted that the size of injectors was formerly definitely indicated by the number, which represented the minimum bore of the combining tube in millimetres. Thus a No. 8 injector measured 8 millimetres inside the throat of the combining tube. This is no longer the case.

Rival makers, anxious to make their number 8 equal to another rival maker's No. 9, have increased the size of the

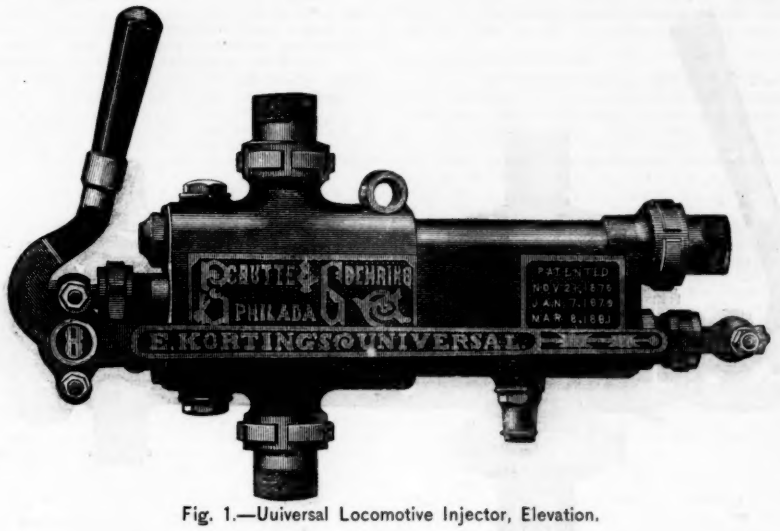


Fig. 1.—Uuiversal Locomotive Injector, Elevation.

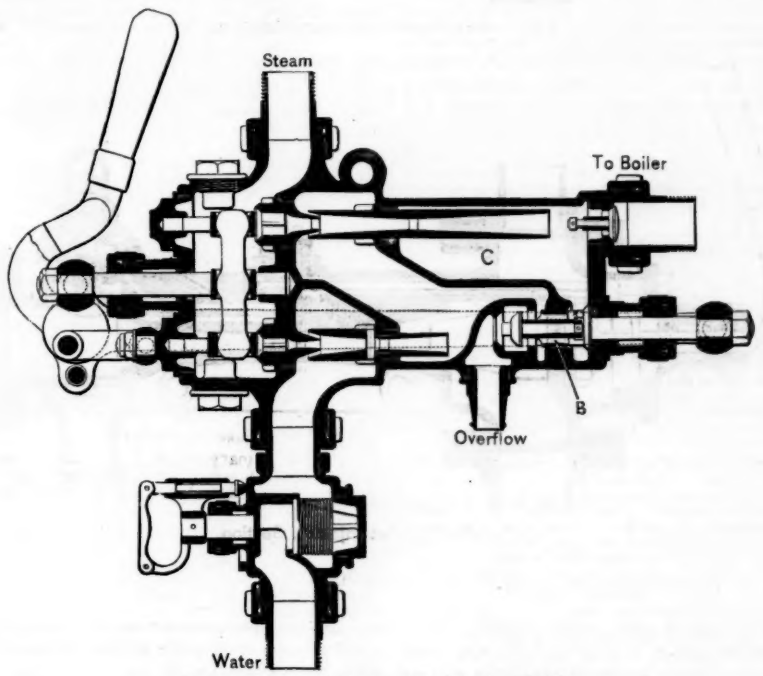


Fig. 2.—Universal Locomotive Injector, Section.

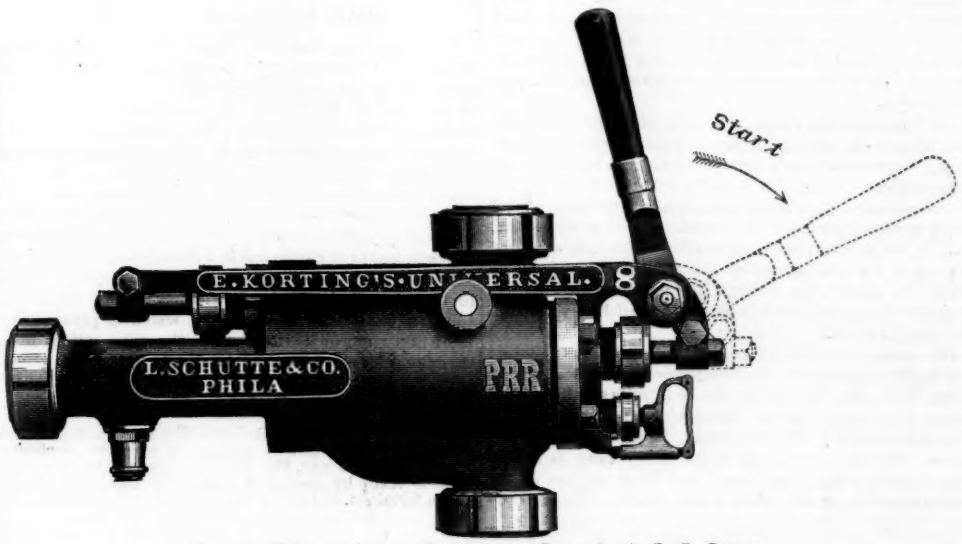


Fig. 3.—Universal Locomotive Injector, Pennsylvania R. R. Pattern.

KORTING'S INJECTORS.

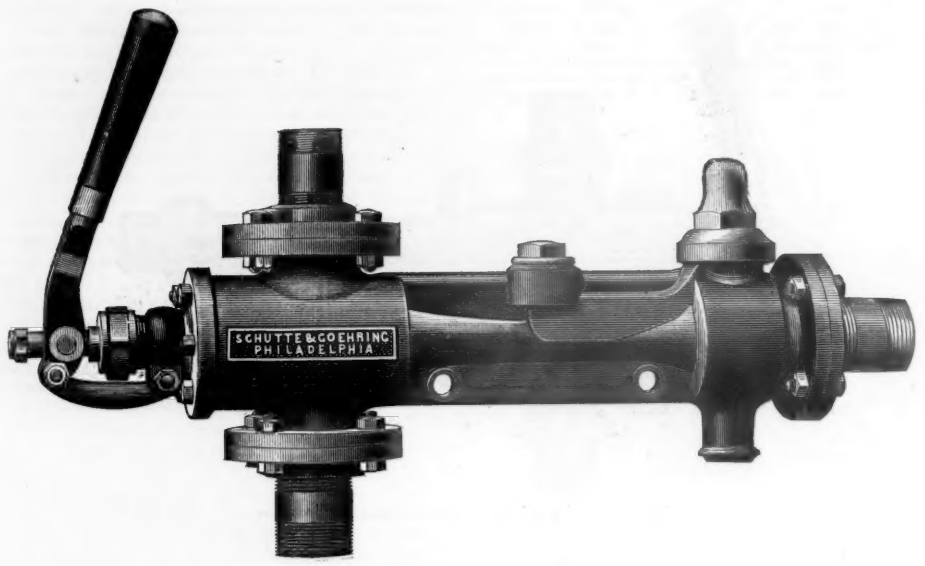


Fig. 4.—Washing-Out Injector, Elevation.

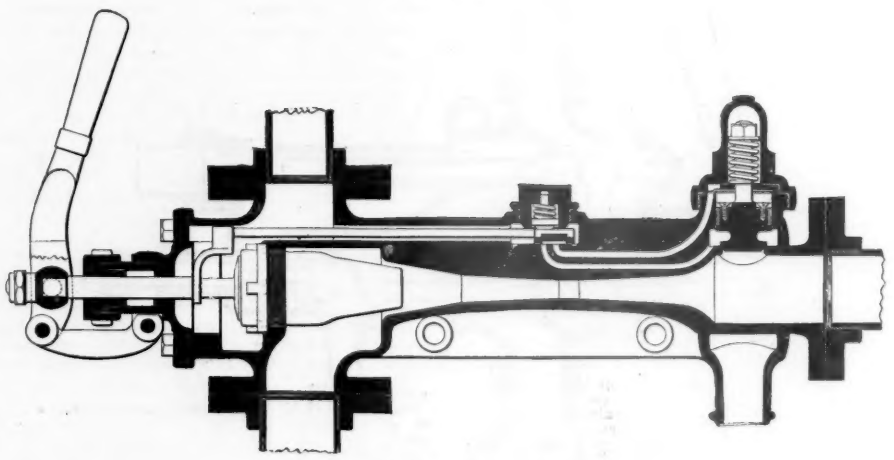

Fig. 5.—Washing Out Injector, Section.

## KORTING'S INJECTORS.

essential parts of their injectors while retaining the old numbers. A modern No. 8 is therefore really a far larger injector than a No. 8 made ten or twelve years ago, and will throw more water. The limit to the increased size of injectors has now been nearly reached, as any further increase in the amount of water fed into a boiler can only be obtained by increasing the size of the feed-pipes. A No. 9 injector is about the largest in general use and measures about 10 millimetres in the nozzles. It is stated that an injector of this size will throw as much water as a 2-in. pipe can convey.

The "washing-out injector" illustrated on figs. 4 and 5 is also adapted to extinguish fires. It is specially proportioned to give a stream of hot water at a high velocity. The most noticeable feature in its construction is, however, the provision made for relieving the excessive pressure caused by an accidental stoppage of the outlet or a kink in the hose, etc. A self-acting starting and relief valve is so arranged that under these circumstances the injector will continue its functions, discharging through the overflow until the obstruction is removed, when it will continue delivery through the proper channel.

The means by which this is accomplished are as follows: The delivering chamber of the injector is provided with a safety valve, which is kept tightly against its seat by a spiral spring (see fig. 5), but is loaded by the pressure of steam with which the injector is worked. When the injector is not at work, as shown in fig. 5, the safety valve is loaded only by the spring, both upper and lower surfaces of the piston attached to the valve communicating through the

overflow with the atmosphere. When the injector is started, this condition of things still prevails, and the mingled steam and water can lift the safety valve, and escape by the overflow. When, however, the handle is pulled full back, a small slide valve is opened and admits steam above the safety valve piston, the pressure closing the safety valve. Any obstruction in the pipes, however, increases the pressure in the receiving chamber of the injector and lifts the safety valve, which permits the obstructed stream to escape by the overflow. When the obstruction is removed, the decrease of pressure in the receiving chamber is insufficient to keep the safety valve open against the combined pressure of the steam and the spring on the top of the safety valve piston, and the safety valve consequently closes and the injector starts again automatically without requiring any further attention.

## Stakes for Elevation of Curves.

The engraving herewith shows a system in use on the Pittsburgh Cincinnati & St. Louis Railway for accurately indicating on the ground the points at which the elevation of the outer rail should begin and end, and the number of inches of elevation to be given. The stake marked *E* 5 means that the elevation shall be 5 in. on the regular curve (varying of course with each curve), which is gradually reduced until at the stake *E O* the track is again level. The system is especially suitable, of course, for use with curves eased off by spirals, which on this road are made 60 ft. long for each degree of curve, but is not necessarily restricted to such use. The cost is small and the effect ought certainly to be good, if simply by inculcating careful attention to securing uniformity of elevation, which is perhaps even more important in its effect upon the easy riding of car than the precise rate of elevation itself.

## Lighting Trains by Electricity.

The London & Brighton Railroad (England) has just completed a new method of lighting a train by electricity. Nearly six years ago, the company lighted up a Pullman express train by means of secondary batteries, charged at the terminus and there transported into the train, after doing duty in supplying light to Brighton and back, these had to be taken out and recharged. Since then two other trains lit by electricity have been running now for some time. In the present train the current is generated in the van without the use of an auxiliary engine, and sufficient storage power is provided to supply light during stoppages, temporary break-downs and the like. No electrician attends this train, the plant being left in charge of the conductor. The train consists of 11 cars, seating 482 passengers, and is used on suburban service.

The dynamo is driven by duplicate leather link belts from pulleys on the axle. The dynamo feeds into a secondary battery, of the Faure-Sellon-Volkmar type, of 22 cells, and from this the conductors are led down the roof of the carriages to supply the lamps, of which there are 36, of 16 candle-power each. By means of a switch in the baggage car these lamps can be turned on in the daytime upon entering a tunnel and extinguished upon leaving it. The cells weigh 112 lbs. each, and the rest of the plant brings the total weight to 3,360 lbs.

The general idea of a dynamo driven from the axle and used in conjunction with an accumulator, was started very soon after the Faure battery appeared, but the schemes were defective because they made no provision for reversing the brushes when the train moved backwards, and did not prevent the battery discharging through the dynamo at low speeds. These two points have been successfully attacked by Mr. Stroudley and Mr. Houghton on the Brighton trains. There are two sets of brushes on the dynamo, the arrangement being much the same as that used in the electric launches. These brushes are manipulated by a lever connected to an armature under the influence of the field magnets. Supposing the train to have been running in one direction the armature will be drawn towards one field magnet, and will hold the "forward" brushes against the commutator. Immediately the train is backed the polarity of the magnets will be reversed, the armature will be attracted to the opposite magnet, and instantly will draw off the first set of brushes and apply the second. The brushes are of the Brush type, like oak graining combs, and do not suffer from a slight reverse motion of the commutator. The apparatus for making and breaking the connection between the dynamo and the battery is entirely mechanical and wonderfully simple. A screw pump, driven by a band from the dynamo shaft, works in a reservoir of mercury. From this reservoir there rise two tubes, also partly filled with mercury. The action of the pump is to draw the liquid out of one tube and force it up the other, the difference of the two heights depending upon the speed of the screw. One of the poles of the dynamo is connected to the mercury, and one of the poles of the battery is likewise connected to an insulated terminal in the rising main of the pump. This terminal is fixed at such a height that when the train attains its average speed, 20 miles an hour for a suburban train, and more for an express, the dynamo and the battery are connected. The gearing between the generator and the axle is so designed that at this speed the electromotive force of the current is greater than that of the battery. With this exceedingly ingenious arrangement, which works equally well whichever way the train runs, the circuit is made and broken with the most constant regularity, and all chance of waste of current is avoided. The baggage car is provided with a Stroudley speed indicator,* which shows the exact rate at which it is traveling, and forms a check upon the regulator. One train has already been running 11 months, making 27,322 miles. The train cannot conveniently be broken up, but for solid trains it seems to fulfill all the essential conditions. The illumination is most ample, far better than the most careful oil or gas lighting, the dynamo runs without supervision, and the expenditure of power is not great. A current of 40 ampères and 44 volts represents about 2¼ electrical horse-power, or say 4 indicated horse-power, and besides this there is only interest, depreciation, and renewal of lamps to provide for.

The extra consumption of coal on the locomotive, due to the power required to drive the dynamo, would be about ¼ lb. per mile, taking an average of day and night trains. The motion of the train does not appear to affect the durability of the lamps, or the action of the dynamo. The connections between the cars are easily joined together and can be pulled apart without further attention when a car is detached.

## Transportation in Congress.

In the House on the 16th:

In the debate on the Inter-State Commerce bill the House voted to substitute the well-known Reagan bill for the bill reported by the committee, which has been under consideration. Several minor amendments were offered, and the discussion is to be continued.

# TECHNICAL.

## Locomotive Building.

The Brooks Locomotive Works in Dunkirk, N. Y., have taken an order for two locomotives for the Cincinnati, Hamilton & Dayton road.

H. K. Porter & Co., in Pittsburgh last week shipped a locomotive to Mexico. They also received an order for a light locomotive to go to Cuba.

The new McQueen Locomotive Works, which were built at Schenectady, N. Y., last year, but have not been fully equipped or opened, are likely to be utilized soon. Owing to the difficulty of obtaining orders to build new locomotives, the shareholders refused to supply the funds needed to put the works in condition for building engines. Ex-Senator Charles Stanford has now come forward and bought up $150,000 worth of the stock, and the report is, that he intends putting the shops to work within a few months.

## Car Notes.

The Pullman car shops at Pullman, Ill., have received orders for 15 passenger cars for the North Hudson County elevated road at Hoboken, N. J.; also for some passenger cars for the Brooklyn Bridge railroad.

The Rote automatic brake has been adopted by the New York, New Haven & Hartford Co., and a contract has been made by the Rote Automatic Brake Co. to supply the entire freight equipment with the brake.

## Iron Notes.

The Scranton Steel Co., with its marvelous two little converters, yesterday made in the steel works, in one 12-hour turn, 65 heats, while the Rail Mill rolled 1,120 rails, weighing 600 lbs. each. This work will be more fully understood when it is known that the Scranton Steel Co. has now developed capacity sufficient to furnish in one year rails enough to build a railroad from New York to Omaha. If this company continues its present fashion of beating its own record day after day, Scranton people may wake up some morning to the fact that there is a pretty large establishment located on the old Slocum flats, to which they are indebted for considerable of their prosperity in these depressed times.—*Scranton (Pa.) Republican Dec.* 11.

The North Chicago Rolling Mill Co. has started up its works at Bay View, Wis., employing some 1,100 men.

The Edgar Thomson Steel Works at Braddock, Pa., shut down Dec. 13. It is uncertain how long the stoppage will continue, but it will probably be short.

Princess Furnace in Botetourt County, Va., went into blast, Nov. 21, and is making 25 tons of iron a day.

The Pennsylvania Steel Works at Steelton, Pa., are busy in all departments. The rail mill recently filled an order for steel rails of unusual weight, 76 lbs. per yard.

The Cambria Iron. Co. in Johnstown, Pa., has recently contracted to make 8,000 tons of steel rails for the Arizona Mineral Belt road, delivery to begin in April next.

A most singular accident happened at the Pennsylvania

* Illustrated and described on page 800 of the *Railroad Gazette*, Nov. 7, 1884.

Steel Works, Steelton, Dec. 8. One of the huge converters containing tons of molten steel was overturned by the breaking of the pins and the contents dumped into the pit. The contact of the metal with the water in the pit created an explosion and a splash that was simply terrific, yet but one man of all those employed about the converter was hurt and he was slightly burned by the flying metal.

Pittsburgh parties are negotiating for the purchase of the Westlake Rolling Mill at Warren, O., for the purpose of turning it into a steel mill.

### Manufacturing and Business Notes.

Messrs. Gould & Eberhardt, of Newark, N. J., have recently received a number of orders for machine tools, in spite of the depressed condition of trade. Among other orders they have one from the Sibley College of Mechanical Arts, at Cornell University, for a planer to plane surface plates and other very accurate work. They are now getting out a new 15-in. automatic gear-cutter (covered by their patent) for small and accurate work, to work quickly; also a new 6-in. stroke patent shaper for small die makers. They exhibit at New Orleans a patent automatic gear-cutter, a patent shaper, a drill press and engine lathe. They have received medals for their exhibits at the Pacific Coast and Cincinnati Exhibitions, and four at the American Institute this year, including the special medal.

E. P. Allis, of Milwaukee, Wis., is making a very large blowing engine for the Lucy Furnace.

William White & Co., of Moline, Ill., are making two double-ender bending machines for the United States Rolling Stock Co., to be used for bending the iron for car truck frames.

### The Rail Market.

*Steel Rails.*—The demand is chiefly for small lots, quotations for which continue $28@$28.50 per ton at mill. The mills now running have orders enough to keep them busy for a time, and are not disposed to shade prices.

*Rail Fastenings.*—The market continues dull, with spikes quoted at 2 cents per pound in Pittsburgh; track bolts 2.25@2.50 cents, and splice-bars 1.65@1.75 cents.

### Blast Furnaces of the United States.

The *Iron Age* gives the following statement of the condition of anthracite and bituminous furnaces on Dec. 1, with their weekly capacity in tons:

| | Anthracite | | | | Bituminous | | | |
|---|---|---|---|---|---|---|---|---|
| | In blast. | Capacity. | Out of blast. | Capacity. | In blast. | Capacity. | Out of blast. | Capacity. |
| June 1... | 106 | 27,972 | 124 | 27,305 | 98 | 48,003 | 127 | 42,901 |
| July 1... | 10 | 26,949 | 130 | 28,765 | 98 | 47,630 | 127 | 44.211 |
| Aug. 1... | 95 | 26,144 | 133 | 29.525 | 88 | 43,877 | 138 | 49,244 |
| Sept 1.. | 88 | 22,864 | 139 | 32.959 | 83 | 42,868 | 142 | 48.973 |
| Oct. 1... | 86 | 23,539 | 141 | 32,460 | 79 | 40,410 | 146 | 52,136 |
| Nov. 1... | 86 | 23,049 | 145 | 31,150 | 86 | 43,040 | 136 | 48,992 |
| Dec. 1... | 88 | 22,963 | 137 | 30,405 | 93 | 43,880 | 129 | 48,197 |

"These figures show that there has been but little change in the condition of anthracite furnaces since Sept. 1, the same number being in blast at both dates.

"The bituminous furnace figures show an increase of 7 furnaces in blast, the same increase as in the previous month. The only marked increase in any of the districts is in Alabama, 3 furnaces having blown in; the only marked decrease is in Illinois, 3 being blown out. We have no reports for one year ago, but, as compared with Jan. 1, there are 88 anthracite furnaces now in blast, as against 109 on Jan. 1, and 93 bituminous, as against 101 on that date."

### Locomotives at the New Orleans Exhibition.

The Baldwin Works have lately despatched four locomotives to the Exhibition, a Mogul engine for the Cincinnati, New Orleans & Texas Pacific; a ten-wheeler for the Central of Georgia, and two 16 by 24 in. cylinder American type engines; one being for Morgan's Louisiana & Texas, and the other for the Jacksonville, Tampa & Key West.

The Cincinnati, New Orleans & Texas Pacific Co. will also be represented by a fine passenger engine, constructed at their shops at Ludlow, Ky., from the designs of Mr. James Meehan, Supt. M. P.

The Pittsburgh Locomotive Works will contribute one specimen of each of their standard types of engines, American, Mogul and Consolidation.

### Securing Correctness of Workmanship.

A system of inspection is employed in the shops of Goodell & Waters, in Philadelphia, which differs somewhat from the plans adopted in other shops. There is an inspector of work as well as an inspector of machines, but the firm guarantees the perfection of every machine and tool which goes out of the works, and in case of a defect occurring anywhere, either in the casting or finishing, it is charged, not to the man who performed the faulty work, but to the man who erected the machine or who put the individual parts of it together. As the erectors have gauges, and must know the condition of every piece entering into the construction of a machine, they become the most efficient of inspectors. When a piece of work is found to be defective and thrown out by the erectors, the cost is at once charged up to the workmen who are held responsible for the defect. This plan has the effect of making each man an inspector, not only of his own work, but also of the work of every other man engaged on the same job; and when extended through the entire establishment, it practically devolves the duty of inspection upon the whole force collectively, the actual test of usage being the final test.

### Engineers' Club of Philadelphia.

At the regular meeting, Nov. 15, Vice-President J. J. de Kinder in the chair; 44 members and 2 visitors present.

Mr. John Haug presented a description, illustrated by drawings and test specimens, of Mr. Wm. Astor's new steam yacht, the first sea-going steamship built of steel in this country. She is 235 ft. long on load water-line, 30 ft. beam and 20 ft. deep, and has two complete decks of ¼-in. steel plates. Her machinery consists of a compound engine with cylinders 34 and 60-in. diameter and 36-in. stroke, supplied with steam of 85 lbs. pressure by 4 oval boilers built of steel, and having 170 sq. ft. grate surface and 4,200 sq. ft. heating surface.

Mr. Fairman Rogers described the steam yacht "Magnolia," built in 1882, by the Herreshoff Manufacturing Co., Bristol, R. I.

The Secretary presented, for Mr. E. F. Smith, an illustrated description of a floating coffer-dam, which is used in removing obstructions from the channels of the Schuylkill Navigation Co. Its dimensions are 32 ft. by 48 ft., and 20 ft. by 36 ft., formed by the union of two halves, which, when placed end to end, could pass through the locks of the canal. This form also enables its easy removal from around a pier after construction. It has water-tight boxes to float it, and to hold the stone to sink it. When in use it is surrounded by sheet piling, and the latter surrounded by puddled clay. It has been worked in from 7½ to 11 ft. of water. It cost $1,128 in 1879, has been much used, and is still in good order; 7 men can shift it, complete, in four to six working days. Average cost of four shifts, $86 for labor; 5 to 10 per cent. of new sheet piling is required for each shift. A 6-in. Andrews centrifugal pump, run three minutes out of every ten, keeps it clear of water. Rock obstructions are removed by steam drill, and blasting by battery.

Mr. Theodore Bergner, introduced by the Secretary, exhibited his designs for drawing-boards. Its parallel ruler, which extends across the face of the board, is guided by means of an endless cord, stretched crosswise over four little grooved pulleys provided at the corners of the board.

Mr. Robert P. Snowden presented an illustrated mathematical discussion of Formulæ for Frogs and Switches, with some notes as to putting in leads for the same.

The Secretary presented, for Mr. Graham Spencer, a description of the Kaolin Beds of Chester Co., Pa., and Newcastle Co., Del.—describing the methods of mining and refining the clay.

Mr. Allen J. Fuller exhibited a new form of Transit Rod, which is made so that the point of the shoe is in the same plane as the face of the rod. There is an opening through the rod, from about 9 in. above the point of the shoe to a height of 6 or 7 ft. At the top of this opening and on the face of the rod, is suspended a plumb-line, which hangs across a marked cross-piece near the lower end of the opening. The plumb-line indicates when the rod is plumb, after which it may be fastened to a hook on the under side of the cross-piece to prevent oscillation by the wind. The transitman sights to this line, which, with the dividing line on the face of the rod, forms a right line throughout its length, perpendicular to the point over which it is set. The rod is provided with short stay-chains, attached to pins, for driving in the ground, that will hold it when set over a tack centre or stone monument. It is also designed to be used instead of plumb-bobs in taking horizontal measurements with the tape-line, to save time and insure greater accuracy.

The Secretary presented, for Mr. R. H. Soule, illustrated notes upon the West Shore Anthracite Engine, No. 24, 8 wheeled, of which class there are 30 on that road. This engine was designed by the late Howard Fry, Member of the Club, Superintendent Motive Power of that road.

The Secretary presented, for Mr. A. H. Haig, a note upon the process of Copying Drawings in Blue Lines upon White Ground.

Mr. W. Bugbee Smith described, with illustration, the method of removal of the West Philadelphia Stand Pipe, which was taken down in 1881, and the masonry and ornamental cast-iron work used in the construction of the Spring Garden Stand Pipe.

### Steel Cars.

The *Engineer* says that in the North of England some 50 cars for the conveyance of coal and iron ore are being made of basic steel plates. Each car requires rather more than a ton of plates to form the sides, bottom and ends. The plates were rolled at the Newport Rolling Mills, Middlesbrough, and were of a quality soft enough for welding and for standing Lloyd's quenching test; they were tough enough also to stand a breaking strain of 26 tons with 27 per cent. elongation and 50 per cent. contraction of area.

## THE SCRAP HEAP.

### An Improvement on the Bell Punch.

A director of a street-car company was a man blessed with a mechanical genius, and he set about to contrive a "patent detector." The idea was a good one, and the mechanism simple in the extreme. A spring board let into the platform of the car, was slightly pressed down by the weight of the in-going passenger, regaining its position as soon as the traveler had entered, scoring "one" on a telltale under the platform after each movement. The apparatus was quietly affixed to one of the cars, which left on a trial journey. At the end, directors, secretary, manager, and happy inventor were in waiting to test the success of the plan by a comparison of the conductor's returns and the dial of the telltale. And this is where the laugh comes in. Whether the conductor in question had received a quiet hint as to the nature of the check that had been placed on his honesty, history sayeth not; but the morning was raw and cold, and the unsuspecting (?) employé, to warm his feet, executed a series of double shuffles, and other extempore step dances on the platform of the car. The run was duly completed, the car returned to the starting-point, the conductor handed in his way-bill, and the telltale was examined. To the surprise of all (inventor included), the latter clearly showed that for the journey the car had carried 1,674 passengers! Needless to say that the contrivance in question was not applied to the remaining cars of the company.—*Railway Express.*

### The Latest Elevated Railroad.

A wild scheme has been promulgated for an elevated railroad in Paris. Ornamental cast-iron columns 16 ft. high are to be erected in the boulevards at intervals of 33 ft. Each column has a casting on the top somewhat resembling the letter V inverted; but at the top and bottom of the V are to project brackets cast with grooves. This is all the permanent way. The rolling stock is to consist of vehicles like half-a-ship or omnibus divided vertically and longitudinally, and sliding in the grooves, the car being of such a length that the fore part enters the grooves of one column before the hind part has left the second behind it, thus being always supported by two columns. The cars are to be propelled by electric accumulators, or by a hot-water locomotive, or by compressed air, or by something else. It is claimed that the streets would not be darkened and disfigured by any girders, the train in itself being a solid traveling girder spanning the distance between the columns. The idea is bold, and if the mere minor difficulties of going round curves, or moving the train at all could be got over, the proposal would have much to recommend it.

### Railroad Young Men's Christian Association.

The rooms of the new Association in Atlanta, Ga., were formally opened on the evening of Dec. 9, when a general reception was given. Speeches were made by Mr. J. W. Harle, President of the Association and by several prominent railroad men, and music was furnished by lady friends. The ladies also supplied a supper.

### Detention of Freight Cars.

The following item from the Holyoke news in the Springfield (Mass.) *Republican* may throw some light upon the complaints made of detention of cars, especially in New England:

"The order issued by several railroads in this vicinity Dec. 1, that all freight must be unloaded from the cars within 48 hours of its arrival, is making busy times among the manufacturers, but it is being complied with to the letter. The railroad companies were obliged to make this rule in order to protect themselves from encroachments. Two months ago it was not an uncommon thing for 2,000 cars, loaded with freight for Holyoke concerns, to stand on the tracks or on the way to the city over the River or Canal roads; since the new order went into effect the number has been reduced to less than 600. It was common to have 150 cars belonging to the Boston & Albany and other roads standing on the tracks waiting to be unloaded, but under the new rule these are unloaded within 48 hours and returned to their owners. The freight which gave the railroad people most trouble was paper stock, which has stood in the cars from three to six months, and one well-known firm allowed some stock to remain unloaded 18 months. Several paper mills are building new stock-houses and others are enlarging old ones. The new order of things has worked well with the storage houses, those on both roads being full and overflowing with merchandise, stock and machinery."

### Conscience Smitten.

"Yes," the old ticket seller continued: "One day an old man came up to the counter with an infirmity of purpose apparent. He looked like a 50-year-old sinner glossed over with 20 years of piety. 'Cap, I want you to do me a favor,' he said; 'it's 19 years since I beat a conductor on the Madison road out of the fare from Seymour to Indianapolis. I was to have paid him when we got into this depot (it's the same one, I see) but Old Nick got into me and I jumped off at the freight depot, and shortly afterward I went to Missoury. 'Tisn't often a man gets religion out there, but when he does it fetches him to right brisk. I jined a Methodist meetin' house long 'bout '70, and ever since then, that stolen ride on the Madison road has been a lump of fire on my conscience. This is the first time I've ever been back here, and I want to pay you that fare with interest,' and the grizzly old fellow put down $4.60. The fare was $2.35 then: (It is only $1.75 now.) I never saw money paid out so cheerfully. I inclosed the money in an envelope and forwarded it to an official of the company, with an explanatory note. The latter never acknowledged the receipt of the same, and I very much doubt whether the stockholders received increased dividends therefrom; but still the old man's conscience was eased."—*Indianapolis News.*

### Crazy Quilt Advertising.

An exchange says that the Chicago, Milwaukee & St. Paul Co., has adopted a delicate method of rendering its line popular with the ladies. Upon bits of white silk, about 4 in. square, is stamped the picture of a wild scene to be witnessed upon the road of this company. A small card-like space in the upper left-hand corner bears the name of the company. Every lady who is so fortunate as to secure one of these bits of silk for her "crazy quilt" will always thereafter think and speak of the St. Paul with favor.

### A Fast Stock Train.

On Saturday the Lake Shore made a trial trip of a fast stock train over its line from Chicago to this city. Heretofore the average time has been 36 hours between these points. Friday afternoon a heavy stock train was made up at Chicago, and the cattle carefully weighed in. It left there at 1 o'clock that afternoon and reached this city at 2 o'clock Saturday afternoon. This makes a run of 25 hours. The cattle were weighed out that a record of the shrinkage might be made. The claim is made that the cattle can be shipped more comfortably on fast trains, run through without stopping to feed, than can be done in stopping to unload and feed them on the way.—*Buffalo Express, Dec.* 15.

### In the Depot.

A man with a handful of roosters' legs came to a pause on the west side of the Fitchburg Railroad depot yesterday afternoon. Dangling from the legs in question were several more or less live roosters. The man paused because another of the fowls had made a bold, swift dash for liberty, and was at that moment perched on a cobble stone in the middle of the yard, cocking his right eye at his late master with a maddening air of triumph.

The man paused but for an instant. Then with a wild plunge he lit out for that rooster, one hand brandished wildly in the air and the other dragging along the luckless mates of the escaped bird. The rooster was equal to the emergency. Quick as a flash leg and wing had borne him across the yard. Again he stopped to meditate on the important questions of the day.

Then the crowd began to gather; teamsters pulled in their fiery steeds and the fun began. Volunteers rushed to aid in the attack; speedy destruction seemed the doom of the rooster. But he quailed not. Stern was his mien and glorious his stride as he meandered over that yard. Go-as-you-please was his motto, and now he would outrival greased lightning as he darted through wheels and under horses' legs, and now discount the national bird as he skimmed through the air in the graceful, giddy way characteristic of roosters and bootjacks. With a hop, skip and a jump he shot through the depot door and proudly strutted up and down the tracks. His most ardent pursuer crawled under a car after the knave, and when he got on the other side the bird had gayly walked back between the wheels. Four men groveled in the dirt and threw gravel at him from each side of the truck. Offended as to his dignity, he wandered forth with celerity, carromed against a baggage truck and rolled out of another door. Across the yard he went and made a good try for a three-foot sill door in the freight house. Foiled here, he fled under a baggage wagon. Then a noisy cur joined the chase and drove him into a corner. The truckman made a valiant dive for him, but he wasn't there. Then he got into a hole and his owner dragged him forth by the wing, squawking Beethoven's sonata in A minor, fortissimo movement. Then he again assumed a perpendicular posture, legs up, and was born on his way.—*Boston Globe.*

### Explosion of a Car Heater.

The sleeping car "Springfield," attached to the First Atlantic, arrived at the Central depot yesterday afternoon in a dilapidated condition. Owing to a lack of water in the heater there was an explosion just west of Batavia, which blew off a portion of the roof and badly scared the passengers. No one was injured. The coach was taken to the East Rochester yards for repairs. The sleeper was a new one, and this was the first trip it had made. The damage will amount to about $200.—*Rochester (N. Y.) Herald.*

### Catching Deer by Rail.

A few days ago as a freight train on the Tyrone & Clearfield road was crossing the summit a buck deer came bounding out of the woods at a great speed, and, being unable to stop, collided with one of the moving cars. The buck fell badly stunned, and lay on the ground as if dead. The engineer of a train following the freight jumped off and cut the buck's throat while he was attempting to regain his feet.

### "Be More Careful."

Willis A. Kane, formerly an employé of the Naugatuck Railroad Co., has just died in Bridgeport, Conn., under peculiar circumstances. Some weeks ago a passenger train on the Naugatuck road was derailed by an open switch at Seymour, and travel was interrupted for three hours. The fault was that of Kane, who was discharged with the mild reprimand from Superintendent Beach, "You ought to be more careful" The words haunted Kane, and continually rang in his ears, and to make matters worse the employés of the road began to pester him with the remark: "You ought to be more careful." One day at dinner he dropped and broke a cup, and, without thinking to offend, his wife said: "Willis, you ought to be more careful," whereupon he sprang upon her and gave her a savage beating. From that time until the day of his death he was a raving maniac, tending switches, twisting brakes, and waving frantic signals, and for the last few days of his life the constant attendance of three men was necessary to restrain him.

## RAILROAD LAW.

### Property in Passes.

In the Circuit Court in Chicago recently, a Dr. Boyd was indicted for selling passes issued by the Chicago & Alton road to another party, under a section of the criminal code. Judge Tuley quashed the indictment on the ground that the section in question applied only to employés of a railroad, but said that, even if broad enough to cover the case, the offense was not punishable, "because there was no property in such a pass, it being of no value to any person except to whom it was issued, and there could be no sale of it, as it was not transferable."

### Authority of Agent in an Emergency.

In the case of McMurray against the Terre Haute & Indianapolis Co., the Indiana Supreme Court holds as follows:

In ordinary cases a conductor or other subordinate agent of a railroad company has no authority to employ surgical or medical assistance for a servant of the corporation who receives an injury or becomes ill, but there are cases which constitute a class in themselves. The authority of an agent is to be determined where he has authority from the facts of the particular case. An emergency may arise which will require the corporation to act instantly, and if the conductor is the only agent present and the emergency is urgent, he must act for the corporation and his action will bind it. There are cases where the train is distant from the supervision of the superior officers where the conductor must act and act for the company. In this case, many miles distant from the main office, a brakeman had his foot crushed by a wheel. The injuries required immediate surgical attention. The conductor, under such circumstances, was authorized to employ a surgeon and bind the company for his payment. In cases of pressing emergency, where the conductor is on the special occasion the highest representative of the corporation, he may do in the emergency what the chief officer might, if present. In cases of emergency, where an employé or other person is injured and requires immediate attention, surgical or medical, or where something urgently needs to be done for the safety of the injured person the conductor has authority to act and bind the company. Any subordinate agent may, in the company's behalf, call surgical aid when the emergencies of the occasion demand it, and when he is the sole agent of the company in whose power it is to summon assistance to an injured and suffering servant.

### Discrimination in Rates.

At Cleveland, O., Dec. 13, a verdict was given for the plaintiff in the suit of Scofield, Shurmer & Teagle *vs.* the Lake Shore & Michigan Southern Co. In the review of the case, Judge McKinney said:

"The demands of the plaintiffs, as stated, and the right to recover damages, are based upon two propositions: First, the plaintiffs during the time covered by this controversy were required to and did pay the road $5,551 on the shipment of 58,833 barrels of oil more than the Standard Oil Co. paid the road during the same time for a like shipment to the same points; second, that during this time the road refused to furnish cars to Scofield, Shurmer & Teagle at their refinery, on which to load their oil, making it necessary for them to cart it to the road at an expense of $978, while the road was furnishing cars to the Standard Oil Co. at its refinery. These two claims thus made in the plaintiff's petition constitute the only grounds upon which a recovery can be had, if it can be had at all.

"If the plaintiffs can recover at all upon the first claim made in their petition it is solely upon the ground that the road charged them higher rates than it did the Standard Oil Co., and the compensatory damages to which they claim they are entitled is the difference between the rate charged per barrel on shipments made by them and the rates charged the Standard Oil Co. to the same points. Some of the questions involved in this case are of great importance in their bearings upon the rights and interests of railroads and the public. * * *

"What is equality may depend on many things. It is true, it is easy to see, that to discriminate between shippers at the mere caprice or whim of the carrier, everything being equal, is unjust, unfair, and wrong. A discrimination on the part of the Lake Shore road in favor of the Standard Oil Co. against Scofield, Shurmer & Teagle, on the ground that the Standard furnished the largest quantity of oil for shipment, and on that ground alone, everything else being equal, would be, and is, unwarranted, and if Scofield, Shurmer & Teagle, for such reason, and under such circumstances, were required to pay and, in fact, did pay to the Lake Shore road a greater rate for freight in car-loads to the same points than did the Standard Oil Co. during the same period of time, the plaintiffs are entitled to recover the excess they thus paid, with interest thereon from the date of payment."

The jury returned a verdict of $5,000 damages for plaintiffs, finding that there had been discriminations within the limits laid down by the Court.

## ANNUAL REPORTS.

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## New York Central & Hudson River.

The annual report of this company to the New York Railroad Commission for the year ending Sept. 30 last, which is the only report which the company makes public, has been issued and from it the figures given below are derived.

The mileage of road worked—441.75 main line, 306.99 branches owned and 244.55 branches leased, 993.29 miles in all—remains apparently unchanged. The mileage of track increased from 2,684.88 to 2,702.90 by the addition of 18.02 miles new sidings and additional tracks.

The equipment consists of 657 locomotives; 333 passenger, 2 dining, 63 composite, 97 second-class and emigrant and 134 baggage, mail and express cars; 24,930 freight cars. This is an increase of 2 locomotives and a decrease of 2 passenger, 2 composite, 2 baggage and 581 freight cars.

The balance sheet at the close of the last two fiscal years is as follows:

*Liabilities.*

| | 1883. | 1884. |
|---|---|---|
| Capital stock | $89,428,300 | $89,428,300 |
| Funded debt | 49,997,233 | 56,497,233 |
| Unfunded debt | 4,689,243 | 3,794,632 |
| Income and earnings | 16,127,199 | 12,803,405 |
| Totals | $160,241,975 | $162,523,570 |

*Assets.*

| | | |
|---|---|---|
| Cost of road and equipment | $114,731,918 | $114,801,239 |
| Consolidation certificates representing cost of road to this company | 31,157,904 | 31,157,904 |
| Hudson River bridges | 1,914,957 | 1,982,613 |
| Dunkirk, A. V. & P. R. R. | 2,920,621 | 2,920,621 |
| Geneva & Lyons R. R | 331,890 | 331,890 |
| Real estate | 1,073,500 | 1,073,500 |
| Advances on Harlem construction account | 317,993 | 6,728 |
| Stock Troy Union R. R. | 15,000 | 15,000 |
| Stock Buffalo Cross Town R. R. | 12,685 | 12,685 |
| Stock Merchants' Desp. Trans. Co. | 1,801,375 | 1,801,375 |
| Stock Pittsburgh & Lake Erie R. R. | 110,000 | 110,000 |
| Stock New York Central and Niagara River R. R. | 28,100 | 28,100 |
| Stock and bonds Syr. G. & C. R.R. | 184,010 | 181,010 |
| Stock Westinghouse Air Brake Co. | 18,750 | 18,750 |
| Stock Morris Run Coal & M. Co. | 900,000 | 900,000 |
| Bonds Lamoille V. Extension R. R. | 110,000 | 175,000 |
| Fuel and supplies on hand | 1,824,569 | 1,383,362 |
| Cash on hand | 376,374 | 1,491,221 |
| Station balances | 1,089,420 | 1,141,915 |
| Connecting railroad and other balances | 690,413 | 2,252,749 |
| United States | 186,298 | 299,712 |
| Equipment Harlem line | 404,394 | 404,394 |
| Sundry open accounts | 32,804 | 33,804 |
| Totals | $160,241,975 | $162,523,570 |

Increase in funded debt, $6,500,000. The authorized issue is $10,000,000, the balance being reserved to take up bonns maturing in 1885 and 1887.

The expenditures for additions to property were $370,571; property sold and decrease in equipment, $301,250, leaving a net addition of $69,321 to cost of road.

The traffic for the year was as follows:

| *Train miles:* | 1883-84. | 1882-83. | Inc. or Dec. | | P.c. |
|---|---|---|---|---|---|
| Passenger | 6,425,258 | 5,801,461 | I. | 623,797 | 10.8 |
| Freight | 10,027,577 | 11,038,556 | D. | 1,010,979 | 9.2 |
| Total | 16,452,835 | 16,840,016 | D. | 387,182 | 2.4 |
| Passengers carried | 11,059,939 | 10,746,025 | I. | 313,014 | 2 9 |
| Passenger-miles | 387,829,986 | 429,385,561 | D. | 41,555,675 | 9.7 |
| Tons freight carried | 10,212,418 | 10,992,440 | D. | 680,022 | 6.2 |
| Ton-miles | 1,970,087,115 | 2,200,996,7.0 | D. | 230,809,685 | 10.5 |
| *Av. train load:* | | | | | |
| Passengers, No. | 60 | 74 | D. | 14 | 18.9 |
| Freight tons | 196 | 199 | D. | 3 | 1.5 |

Of the passengers carried last year 136,736 and of the tons carried 1,495,066 were through. The average passenger journey decreased from 40 to 35 miles; the average freight haul from 202 to 193 miles.

The average receipts per train-mile and per unit of traffic were, in cents:

| | 1883-84. | | | 1882-83. | | |
|---|---|---|---|---|---|---|
| | Receipt. | Cost. | Net. | Receipt. | Cost. | Net. |
| Per pass.-train mile | 117.00 | 86.00 | 31.00 | 147.00 | 96.00 | 51.00 |
| Per freight-train mile | 164.00 | 123.00 | 41.00 | 182.00 | 137.00 | 45.00 |
| Per pass.-mile | 1 94 | 1.42 | 0.52 | 1.98 | 1.30 | 0.68 |
| Per ton-mile | 0.83 | 0.62 | 0.21 | 0.91 | 0.68 | 0.23 |

There was a decrease in both passenger and freight rates. In passenger expenses there was an increase, but there was a decrease in freight expenses almost equaling the loss in rates.

The earnings for the year were as follows:

| | 1883-84. | 1882-83. |
|---|---|---|
| Passengers | $7,533,214 | $8,526,843 |
| Freight | 16,434,983 | 20,187,433 |
| Mails | 691,520 | 690,469 |
| Rents | 1,319,531 | 1,263,586 |
| Car service | 1,009,278 | 996,334 |
| Telegraph | 7,426 | 7,912 |
| Interest | 420,369 | 493,630 |
| Use of road | 313,052 | 306,915 |
| Other sources | 419,296 | 1,342,600 |
| Totals | $28,148,669 | $33,770,722 |
| Expenses | 17,849,313 | 20,750,594 |
| Net earnings | $10,299,356 | $13,020,128 |
| Gross earnings per mile | 28.339 | 33,999 |
| Net " " | 10.369 | 13,108 |
| Per cent of expenses | 63.41 | 61.44 |

The decrease in gross earnings was $5,622,053, or 16.6 per cent.; in expenses, $2,901,281, or 14.0 per cent.; in net earnings, $2,720,772, or 20.9.

The decrease in earnings from "other sources" is caused by transfer of $641,582, received from sales of old materials, to credit of expense account.

The income account was as follows:

| | | |
|---|---|---|
| Net earnings as above | | $10,299,356 |
| Interest | $3,380,082 | |
| Rents | 1,948,028 | |
| State tax on capital | 178 673 | |
| " " earnings | 123,812 | |
| Dividends, 8 per cent | 7,159,644 | |
| | | $12,790,239 |
| Deficit for the year | | $2,490,883 |

The surplus over interest, rentals, and taxes last year was equal to 5.22 per cent. on the stock; against 8.19 per cent. in the previous year.

The profit and loss account is as follows:

| | | |
|---|---|---|
| Deficit for the year | | $2,490,883 |
| Interest accrued, but not due | | 914,050 |
| Settlement of old internal revenue claim | | 66,332 |
| Total | | $3,471,265 |
| Surplus, Oct. 1, 1883 | $16,127,199 | |
| Premium on bonds sold | 147,471 | |
| | | 16,274,670 |
| Surplus, Sept. 30, 1884 | | $12,803,405 |

The report says: "The profits of the company for 15 years, being the period embraced in the consolidation of the New York Central Railroad and the Hudson River Railroad, have averaged $8.54 per share per year, being an excess of $8.10 per share for the entire period over the $8 per share annually paid."

## Manhattan.

This company formerly leased, but now owns, by consolidation with the New York and the Metropolitan Elevated, the lessor companies, the elevated railroad lines in New York, 32½ miles of double-track railroad, used exclusively for passenger traffic. The statements below have been given out for the fiscal year ending Sept. 30.

The earnings for the year were as follows:

| | 1883-84. | 1882-83. | Inc. or Dec. | | P c. |
|---|---|---|---|---|---|
| Earnings | $3,726,359 | $6,386,506 | I. | $339,853 | 5.3 |
| Expenses | 3,884,949 | 3,756,828 | I. | 128,121 | 3.4 |
| Net earnings | $2,841,410 | $2,629,678 | I. | $211.732 | 8.1 |
| Gross earn. per mile | 208.032 | 197,521 | I. | 10.511 | 5.3 |
| Net " " " | 87.879 | 81,330 | I. | 6,549 | 8.1 |
| Per cent. of exps. | 57.76 | 58.82 | D. | 1.06 | .... |

The statement says: "The operating expenses included extraordinary legal expenses and other expenses to which the company will not be subject the next year.

"All taxes except personal and structure taxes are included in operating expenses."

The income account for the year was as follows:

| | | |
|---|---|---|
| Net earnings, as above | | $2,841,410 |
| Interest and rentals | $1,381,713 | |
| Dividends on 1st pref. and Metropolitan stocks, 6 mos. | 390,000 | |
| Dividends on consolidated stock, 6 mos. | 780,000 | |
| | | 2,551,713 |
| Surplus for the year | | $289,697 |
| Interest received | | 29,171 |
| Surplus, Oct. 1, 1883 | | 362,458 |
| Total | | $681,326 |
| Adjustment of back dividends | | 580,058 |
| Actual surplus, Oct. 1, 1884 | | $101,268 |

The amount charged for adjustment of back dividends is for the dividends on Metropolitan stock prior to Oct. 1, 1883, as provided in the agreement of July 1, 1884. The dividends paid were 3 per cent. on $13,000,000 New York and Metropolitan stocks for six months, and 3 per cent. on the $26,000,000 consolidated stock for the second half-year.

The number of passengers carried was as follows:

| | Number. | Per. ct. of total. |
|---|---|---|
| Second avenue line | 10.249,263 | 10 6 |
| Third avenue line | 47,695,460 | 49.3 |
| Sixth avenue line | 29,061.311 | 30 1 |
| Ninth avenue line | 9,696,586 | 10.0 |
| Total | 96,702,620 | 100.0 |

The total increase over the preceding year was 4,577,677 passengers, or 4.97 per cent. The average fare per passenger last year was 6.956 cents, against 6.932 cents in the preceding year.

## Richmond & Danville.

This company owns the Richmond & Danville (including the Piedmont) road, from Richmond, Va., to Greensboro, N. C., 189 miles, with 12.2 miles of branches, and the Northwestern North Carolina road, 25.2 miles. It leases the Richmond, York River & Chesapeake, Richmond to West Point, 38 miles; the North Carolina road, Goldsboro, N. C., to Charlotte, 223.1; the Atlanta & Charlotte Air Line, Charlotte, N. C., to Atlanta, Ga., 269; making 756.5 miles worked in all. The report is for the year ending Sept. 30.

The company controls and works the Milton & Sutherlin, 6.8, and the State University road, 9.2 miles, which are reported separately. Through the Atlanta & Charlotte lease it controls 70 miles of narrow-gauge branches in Georgia. Through the Richmond & West Point Terminal Co. it controls the Charlotte, Columbia & Augusta, the Columbia & Greenville, the Georgia Pacific, the Western North Carolina and the Virginia Midland roads, 1,520 miles of road in all.

The funded debt consists of $1,231,100 consolidated, $4,018,000 general mortgage and $3,969,000 debenture bonds, a total of $9,218,100; an increase during the year of $320,000 general mortgage bonds. The matured and unpaid interest on the debentures amounts to $357,310. The floating debt consists of $791,263 bills payable.

The earnings for the year were as follows:

| | 1883-84. | 1882-83. | Inc. or Dec. | | P.c. |
|---|---|---|---|---|---|
| Freight | $2,511,760 | $2,591,182 | D. | $79,422 | 3.1 |
| Passage | 955,184 | 909,564 | I. | 45.620 | 5.0 |
| Mail and express | 238,651 | 220.965 | I. | 17.686 | 8 0 |
| Miscellaneous | 94,787 | 84,081 | I. | 10,706 | 12.7 |
| Total | $3,800,382 | $3,805,792 | D. | $5,410 | 0.1 |
| Expenses | 2,202,541 | 2,218,854 | D. | 16,313 | 0.7 |
| Net earnings | $1,597,841 | $1,586,938 | I. | $10,903 | 0.7 |
| Gross earnings per mile | 5,024 | 5 031 | D. | 7 | 0.1 |
| Net earn. per mile | 2,112 | 2,098 | I. | 14 | 0.7 |
| P. c. of exps | 57.95 | 58.30 | D. | 0.35 | .... |

The freight movement shows a decrease of 5,496,609 mile-tons compared with last year.

The passenger-mileage has increased 1,381,040, with an increase in revenue of $45,619.40.

The earnings of the several lines were as follows:

| | Earnings. | Expenses. | Net earnings. |
|---|---|---|---|
| Rich. & Danville | $1,575.571 | $761,748 | $813,823 |
| Rich., York River & Ches. | 239,727 | 117.6 1 | 122,096 |
| North Carolina | 866,626 | 593,303 | 274,323 |
| N. W. North Carolina | 75,827 | 25,958 | 49,869 |
| Atlanta & Charlotte | 1,042,631 | 703,901 | 338,730 |
| Total | $3,800,382 | $2,202,541 | $1,597,841 |

The report says: "The track has been greatly improved through its entire extent. During the year iron rails have been replaced with 60-lb. steel rails, as follows: On the Richmond & Danville and Piedmont roads, 680 tons; on the North Carolina road, 2,027 tons; on the Atlanta & Charlotte Air-Line, 6,955 tons; renewing in the aggregate 101½ miles of track. On the Richmond, York River & Chesapeake road about 15 miles have been substantially repaired by the substitution of partly-worn fish-bar rails, for the old chair rails in use on a portion of that road.

"That section of the James River bridge next to the Richmond station has been replaced by an iron structure of two spans, securing a permanent and convenient crossing and affording greater protection against danger of high water. Other structures of this class have received such repairs as their stability and safety require.

"The safety and economy of the train service has been improved by the addition of about three miles of side track at such points as were deemed most suitable. Some additional station accommodations have been made at Jetersville, Va., Charlotte, N. C., and other points. At South Boston, Danville, Salisbury, and a few other stations improvements are much needed, and will in part be provided during the present year. The company's wharf at Rockett's accommodating a valuable traffic interchange with shipping at that point, has been thoroughly rebuilt at a cost of about $12,000, and terminal facilities elsewhere as required have been sufficiently provided for.

"To replace disabled and condemned stock the company has built at its works during the year 2 first-class ten-wheel locomotives, 1 passenger and 2 express cars, and 45 freight cars; also 22 freight cars as an addition to the former freight equipment."

The income account for the year is as follows:

| | |
|---|---|
| Net earnings, as above | $1,597,841 |
| Interest on investments | 19,517 |
| Total | $1,617,358 |
| Interest and rentals | $1,478,530 |
| Loss on branch lines, etc | 2,378 |
| | 1,480,908 |
| Surplus for the year | $136,450 |

The surplus shows an increase of $23,894 over that of the preceding year.

The expenditures charged to new property for the year were: For construction, chiefly part payment for new depot lot in Richmond and the James River bridge, $27,386; for equipment under car trust contracts of 1881-82, $176,311; total, $203,698; expenditures for betterments of Atlanta & Charlotte Air Line, $237,741; Richmond, York River & Chesapeake, $329—making total new property and betterment account for the year, $441,832.

The report of General Manager A. L. Rives says: "The motive power has been well maintained, and has shown itself equal to the demands upon it, except that for the passenger service between Danville and Charlotte, the engines in use having proved themselves too light, it is strongly recommended that four heavier engines be purchased. Special attention has been paid to the adoption of economical devices calculated to diminish the consumption of fuel for equal service performed, and will be continued in view of the encouraging results which have been obtained on 25 engines.

"Eight miles south of Danville there is a mile of heavy temporary grade, on which assistant power is used for freight trains at an annual outlay nearly sufficient to reduce the grade to the maximum standard. This work should undoubtedly be undertaken in the spring and pushed steadily to completion.

"In view of the fact that several of the largest railroad systems in the Southern states are contemplating a change of gauge from 5 ft. to 4 ft. 9 in., preparations have been made and are making which will enable us to take similar action with the maximum economy at the proper time. I am satisfied that such change, when accomplished, will result in an increase of business and reduction of expenses."

Accounting for the decrease in the traffic for the past year by the falling off of at least one-third of the cotton crop, and by the general depression of business, President Buford says: "During the two months elapsed since the close of the fiscal year now reported, the improved movement of traffic indicates a healthy and substantial re-action from the inactivity which prevailed during the preceding period of the year. The associated lines of the Richmond & Danville system, having gone through the year successfully and received meanwhile material improvements, are making fair advances in value and resources and effectiveness as parts of the system. The Georgia Pacific road is rapidly developing a traffic beyond any conservative expectations heretofore entertained. Its future as a valuable and successful property is assured. The construction of the Western North Carolina road has been finished to the full completion of all engagements in connection with that property. A large portion of the old division of the road has been thoroughly and permanently repaired with steel rail track and other betterments. The traffic of those districts opened up by the new construction gives encouraging indications of continued increase, and the whole territory thus newly developed presents an inviting field to capitalists and new settlers seeking investment, or employment in agriculture, mines or manufacture."

## Naugatuck.

This company owns a line from Stratford Junction, Conn., to Winsted, 57 miles, and it also uses the New York, New Haven & Hartford track from Stratford Junction to Bridgeport, 4 miles, making 61 miles in all. The report is for the year ending Sept. 30.

The company also furnishes train service under agreement, over the Watertown & Waterbury road, a branch 4½ miles long.

The general account is as follows, condensed:

| | | |
|---|---|---|
| Stock | | $2,000,000 |
| Funded debt | | 150,000 |
| Accounts and balances | | 44,768 |
| September expenses | | 33,645 |
| Profit and loss, balance | | 394,599 |
| Total | | $2,623,012 |
| Road and property | $2,423,284 | |
| Stocks and bonds owned | 12,600 | |
| Materials | 45,398 | |
| Bills and accounts receivable | 60,588 | |
| Cash | 81,142 | |
| | | 2,623,012 |

The funded debt consists of first-mortgage bonds bearing 4 per cent. interest. The amount authorized is $750,000, but only $150,000 have been issued.

The train mileage for the year was as follows:

| | 1883-84. | 1882-83. | Increase. | P.c. |
|---|---|---|---|---|
| Passenger | 180,488 | 154,673 | 25,815 | 16.7 |
| Freight | 141,428 | 140,425 | 1,003 | 0.7 |
| Construction and switching | 71,032 | 70,026 | 1,006 | 1.4 |
| Total | 392,948 | 365,124 | 27,824 | 7.6 |

There was a large increase in passenger train service, the other mileage showing very little change.

The earnings for the year were:

| | 1883-84. | 1882-83. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Freight | $375,513 | $425,066 | D. $49,553 | 11.7 |
| Passengers | 266,075 | 261,682 | I. 4,393 | 1.7 |
| Mail, etc. | 35,127 | 26,118 | I. 9,009 | 34 6 |
| Total | $676,715 | $712,866 | D. $36,151 | 5.1 |
| Expenses | 451,099 | 482,872 | D. 31,773 | 6 6 |
| Net earnings | $225,616 | $229,994 | D. $4,378 | 1.9 |
| Gross earn. per mile | 11,094 | 11,686 | D. 592 | 5.1 |
| Net " " | 3,699 | 3,770 | D. 71 | 1.9 |
| Per cent. of exps. | 66.66 | 67.74 | D. 1.08 | .... |

Expenses include taxes, which were $32,349 last year, against $28,371 the preceding year. Excluding taxes, the reduction in expenses was very nearly equal to that in gross earnings.

The income account is as follows:

| | | |
|---|---|---|
| Net earnings, as above | | $225,616 |
| Balance of interest account | $3,856 | |
| Dividends, 10 per cent | 200,000 | |
| | | 203,856 |
| Surplus for the year | | $21,760 |
| Surplus, Oct. 1, 1883 | | 372,839 |
| Balance to credit of profit and loss, Sept. 30, 1884 | | $394,599 |

The report says: "During the past year the double track from the junction at the Housatonic River, north for a distance of 6 miles, has been completed, and is now in use. No addition has been made to the bonded debt during the year."

The report makes appropriate mention of the death, Dec. 7, 1883, of Mr. E. F. Bishop, who had served as director or President of the company for 35 years, and to whose prudent management it is largely indebted for its prosperity.

## Richmond & Petersburg.

This company owns a line from Richmond, Va., to Petersburg, 22.5 miles, with a branch to Port Walthall, 2.5 miles, making 25 miles in all. The report presented at the 50th annual meeting last week is for the year ending Sept. 30.

The earnings for the year were as follows:

| | 1883-84. | 1882-83. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Earnings | $195,369 | $182,821 | I. $12,548 | 6.9 |
| Expenses | 108,299 | 104,576 | I. 3,723 | 3.5 |
| Net earnings | $87,070 | $78,245 | I. $8,825 | 11.3 |
| Gross earn. per mile | 7,815 | 7,313 | I. 502 | 6.9 |
| Net " " " | 3,483 | 3,130 | I. 353 | 11.3 |
| Per cent. of exps. | 55.43 | 57.20 | D. 1.77 | .... |

The President's report says: "The above balance was applied to the payment of the interest on the debt, 5 per cent. dividend on the stock, and part of the cost of the new iron bridge over James River. This bridge has been completed with the exception of the abutment and approach on the north side. The cost so far has been $148,263, which does not exceed the original estimate of Mr. J. R. Kenly, Engineer. The cost has been paid partly by the sale of bonds and partly out of surplus earnings. It may reasonably be expected that the bridge can be completed out of the earnings without further increase of the debt or interference with the payment of a regular dividend. The bonds that matured last April have been paid, and the company owes no floating debt.

"The steel rails already bought, to be laid down during the current year, will complete a steel track all the way."

## Georgia Pacific.

This company owns lines from Atlanta, Ga., to Birmingham and Coalburg, Ala., 178 miles; from Cane Creek, Ala., to Columbus, Miss., 83 miles; from Greenville, Miss., to Jacksonville, 29½ miles, and from Stoneville, Miss., to Sharkey, 22½, making 313 miles in all. The Mississippi lines are of 3 ft. gauge. These lines are to be connected hereafter by extensions from Coalburg to Cane Creek, and from Columbus to Jacksonville. The report is for the year ending Sept. 30.

Additions during the year were from Eden, Ala., to Birmingham, 31 miles, and from Alta to Cane Creek, 18 miles. The road is controlled by the Richmond & Danville Co.

The earnings for the year were as follows:

| | 1883-84. | 1882-83. | Inc. or Dec. | P. c |
|---|---|---|---|---|
| Earnings | $547,975 | $253,687 | I. $294,288 | 116.0 |
| Expenses | 362,494 | 171,644 | I. 190,850 | 111.2 |
| Net earnings | $185,481 | $82,043 | I. $103,438 | 126.1 |
| Gross earn. per mile | 1,851 | 1,472 | I. 379 | 25.7 |
| Net earn. per mile | 627 | 476 | I. 151 | 31.7 |
| Per cent. of exps | 66.15 | 67.66 | D. 1.51 | .... |

The income account given is as follows:

| | |
|---|---|
| Net earnings | $185,481 |
| Extraordinary repairs, wash-outs | 16,503 |
| Balance | $168,978 |
| Surplus from previous year | 20,750 |
| Total surplus | $189,728 |

President Johnston's report says: "We find that all the circumstances considered, the financial results of the year's operations are gratifying. The physical condition of the road has been carefully looked after and is improving. The country traversed shows great progress in enterprise and development. A number of new towns have been established, and these along with the older cities and towns, show healthy and vigorous growth. New mines and manufacturing establishments are being opened and projected, and those in existence continue to be operated vigorously. The policy of encouraging and stimulating local development has been and will be steadily pursued.

"The building of several new branch lines will soon be entered upon. These are short roads leading to mines about to be opened, and they will be built upon terms favorable to this company."

## Mississippi & Tennessee.

This company owns a line from Memphis, Tenn., to Grenada, Miss., 100 miles. It has recently passed under the control of the Louisville, New Orleans & Texas Co. The report is for the year ending Sept. 30.

The earnings were as follows:

| | 1883-84. | 1882-83. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Earnings | $545,017 | $522,101 | I. $22,916 | 4.4 |
| Expenses | 320,431 | 283,357 | I. 37,074 | 13.1 |
| Net earnings | $224,586 | $238,744 | D. $14,158 | 5.9 |
| Gross earn. per mile | 5,450 | 5,221 | I. 229 | 4.4 |
| Net " " " | 2,246 | 2,387 | D. 141 | 5.9 |
| Per cent. of exps. | 58.79 | 54.28 | I. 4.51 | .... |

Interest payments were $159,542, leaving a surplus of $65,044 for the year.

The report says: "We consider the business of the company the past season very satisfactory; while the gross receipts are larger, the net receipts show a small decrease, caused mainly by increase in maintenance of way and maintenance of cars. We can congratulate you upon the fact that your road-bed and equipment were never in better condition at any time during the history of the company. We have laid in the track the last fiscal year 1,515 tons steel rails, or about 17¼ miles, at a net cost to the company, after deducting sale of old rails, of $43,588, and have contracted for 1,500 tons steel rails, or about 17 miles, to be delivered during the coming winter. When these rails are placed in track there will then remain only 34 miles to be provided for during the next two or three years to lay the entire line with steel rails of the most approved pattern."

## Richmond, Fredericksburg & Potomac.

This company owns a line from Richmond, Va., to Quantico, 83 miles. The following statements for the year ending Sept. 30 were presented at the recent annual meeting in Richmond.

The earnings for the year were as follows:

| | 1883-84. | 1882-83. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| Transportation | $469,197 | $468,182 | I. $1,015 | 0.2 |
| Rents | 2,508 | 2,399 | I. 109 | 4.5 |
| Total | $471,705 | $470,581 | I. $1,124 | 0.2 |
| Expenses | 289,840 | 276,180 | I. 13,660 | 5.0 |
| Net earnings | $181,865 | $194,401 | D. $12,536 | 6.3 |
| Gross earn. per mile | 5,683 | 5,670 | I. 13 | 0.2 |
| Net " " " | 2,191 | 2,342 | D. 151 | 6.3 |
| Per cent. of expenses | 61.45 | 58.69 | I. 2.76 | ... |

During the year 1,750 tons of steel rails were laid, leaving but 10 miles of iron in the track. Interest on bonds and dividends on guaranteed stock amounted to $88,923, leaving a surplus of $92,942 for the year.

The loss in net earnings was chiefly due to a change in the method of keeping the accounts, which threw 18 months' expenses upon the year.

The average receipt per train-mile was 151.5 cents; per passenger-mile 2.69 cents, and per ton-mile 1.76 cents.

The President's report says: "Although the earnings of the company warranted the usual dividend, payable in July, the board thought it wise not to declare it, as the Supreme Court of Virginia on April 17, 1884, reversed the decision of the Circuit Court of the city of Richmond (which had sustained your action in issuing dividend obligations to common stockholders only), and ordered similar dividend obligations to be also issued to guaranteed stockholders, and the same dividend paid thereon in cash which had been previously paid on those issued to common stockholders. Although this decree of the Supreme Court was undoubtedly erroneous, it nevertheless became the duty of the board to refrain from declaring dividends, and to accumulate a sum sufficient to meet any cash demand which might be made upon the company under it. The exact amount which might have been required in cash was not determined. It could not possibly have exceeded $30,500, and it seems now probable that it will not exceed $3,600. The matter is still before the courts, with a decree in the state court directing the issue to certain guaranteed stockholders of $42,000 in dividend obligations, and the payment in cash of dividends thereon to the amount of nearly $3,600, and a preliminary injunction granted, upon petition of non-resident holders of common stock, by the United States Court, restraining all further issue of dividend obligations and payment of dividends thereon.

"In July last there fell due $7,000 of 7 per cent. bonds of the company. The amount being so small, the board decided that it was not worth while to extend them even at 5 per cent., and paid them off.

"In July next there will be payable over $200,000 of bonds, the larger portion of which now bear interest at the rate of 7 per cent. It is believed that these can be extended at 5 per cent."

## Western Maryland.

This company owns a line from Baltimore to Williamsport, Md., 90 miles. It controls and operates the Emmettsburg Branch, 7 miles, and the Baltimore & Cumberland Valley road, from Edgemont, Md., to Shippensburg, Pa., 34 miles, but the operations of those roads are not included in the report, which is for the year ending Sept. 30.

The earnings for the year were as follows:

| | 1883-84. | 1882-83. | Increase. | P.c. |
|---|---|---|---|---|
| Earnings | $665,996 | $654,164 | $11,832 | 1.8 |
| Expenses | 407,750 | 399,189 | 8,561 | 2.1 |
| Net earnings | $258,246 | $254,975 | $3,271 | 1.3 |
| Gross. earn. per mile | 7,400 | 7,268 | 132 | 1.8 |
| Net earn. per mile | 2,869 | 2,833 | 36 | 1.3 |
| Per cent. of exps | 61.22 | 61.15 | 0.07 | ... |

The track and machinery have not only been fully maintained during the year, but have been greatly improved. Amount expended for betterments was $100,527.50. Four new locomotives of large size, 6 new coaches, 4 excursion cars, 50 box cars and 50 gondolas of 40,000 lbs. capacity, have been purchased under a car-trust payable by the company in instalments of nearly $7,000 per month. All equipment expenditures were provided for out of the revenue and charged to betterments.

The passengers and freight carried were:

| | 1883-84. | 1882-83. | Increase. | P. c. |
|---|---|---|---|---|
| Passengers | 722,414 | 669,946 | 52,468 | 7.8 |
| Tons freight | 311,025 | 307,139 | 3,886 | 1.3 |

President Hood, in reference to the South Pennsylvania Railroad now being constructed between Harrisburg and Pittsburgh, which will pass within eight miles of the Western Maryland's Shippensburg terminus, and within easy reach of its main line at Hagerstown, which connection the South Pennsylvania Co. has agreed to build, claims that it will afford the shortest practicable line between Baltimore and the principal Western points. This route is expected to be opened for business by the summer of 1886. In view of this important connection, the report urges the necessity for a second track upon the Western Maryland, and promptness in providing for same.

The report suggests that the first three mortgages of $600,000 each may be satisfied at or before maturity, also the funded coupons on same, amounting to $657,100, so the $147,426 of annual interest now being paid on these, if capitalized at 3.65 per cent, would produce $4,039,068, from which deducting $2,457,100 principal of mortgages and funded coupons, and $339,484, the difference between sinking fund accrued and unpaid interest on second mortgage, there would be left, after satisfying mortgages, etc., with money borrowed at 3.65 per cent., a balance of $1,242,484 as additional capital, without any increase in the amount of interest now paid.

The cost of the second track to Hagerstown is estimated at $1,750,000, and, applying the capital gained as above, $1,242,484, would leave say $507,516 to be provided for by further loan, and, assuming it to be procured at 3.65, provision will have been made for the additional track at an annual cost to the company of but $18,524.

As the road is virtually the property of the city of Baltimore, the company relies upon the loan being effected at the low rate of interest by the city granting the use of its credit, for which a new mortgage might be made by the company for $4,546,584.

The low price of steel rails and other materials, as well as labor, makes the present a propitious time for the work.

RAILROAD GAZETTE

Published Every Friday.

## EDITORIAL ANNOUNCEMENTS.

**Passes.**—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

**Contributions.**—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

**Advertisements.**—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

## THE NEW YORK CENTRAL REPORT.

The statement of the earnings and expenses of this railroad for its fiscal year ending with September last, which we published last week, showed decreases from the previous year as follows:

| Gross earn. | Expenses. | Net earn. | Profit per share. |
|---|---|---|---|
| $5,622,053 | $2,901,281 | $2,720,772 | $2.97 |
| 16.6 p. c. | 14.0 p. c. | 21.0 p. c. | 36.3 p. c. |

The position of this company has been radically changed by the completion of two new railroads between New York and Buffalo, one of which is close alongside the New York Central. Of these the Lackawanna was open the whole of last year and about three-fourths of the year before, while the West Shore was open through three-fourths of last year and between New York and Albany a few months of the year before. As usual, however, the new railroads did not get much traffic for some time after they were first opened. Year before last the Lackawanna for four or five months before the end of the fiscal year (Sept. 30) carried a considerable proportion of the profitable through west-bound freight from New York, but not much of the larger east-bound freight. It has apparently never attempted to compete seriously for the through passenger business. The local freight which it has secured has come chiefly from the Erie, along which it lies for 200 miles between Binghamton and Buffalo. During three-fourths of the last fiscal year it was in the west-bound pool and received 12.6 per cent. of the through shipments from New York city. Last winter it began to compete for the live stock brought to New York, and for three or four months it carried a large share of it, often as much as 20 per cent.; but in the last quarter of the year it carried but little, though its effect on the *net* earnings of the other roads was most serious then, as it forced them to carry at unprofitable rates.

On the first of January also the West Shore entered the west-bound pool, and carried 10 per cent. of the New York through shipments. At the same time it began to compete for the through passenger business, but did not get much of it until August or September. It has carried rather more of the through east-bound freight than the Lackawanna, but probably not more than 7 or 8 per cent. of that going to New York, and a much smaller part of that going to New England, and this for only about seven months of the fiscal year. Since Jan. 1 it has competed for the local passenger traffic throughout its length, and has had a large amount of that between New York and Albany, apparently a much smaller part of that between Albany and Buffalo, but it affected rates and traffic more or less by frequent cheap excursion trains. It is important to bear in mind that the considerable through travel thrown upon it by the co-operation of the Baltimore & Ohio and the great reduction of fares to Chicago began but a few weeks before the close of the last fiscal year, and have already affected the business of the current fiscal year (since September) twice as long. And it is especially important to remember that the cent-a-mile local rate did not go into effect until *after* the close of the last fiscal year. It seems to have got very little local freight at any time, but the Central largely reduced its rates on this before the West Shore was opened, and presumably on account of the threatened competition.

On the whole, then, the New York Central suffered during its last fiscal year by the diversion to the two new roads of 22.6 per cent. of all New York through shipments for nine months, and of what the Lackawanna carried for the first three months, which was perhaps 20 per cent. in tonnage, but mostly lower class freight. This may have reduced the New York Central's earnings from this business 20 per cent. for the whole year. The east-bound through freight to New York was reduced not more than 10 or 12 per cent. for the whole year by the same competition; the New England freight by much smaller proportions; the through passenger travel, taking the year through, only by a small amount; the local passenger travel by a more considerable amount, which we can only guess at.

We examine into the effects of this competition because the New York Central's great decrease in earnings last year was not by any means wholly due to the new roads to New York, and because these roads were not so effective as competitors, taking the year through, as they are now and will be hereafter. Both may be expected, in time, to increase their proportion of the east-bound through freight, and perhaps of the west-bound; the West Shore will be open the whole of the year instead of part of it, and will not only have the large share of the travel which is got near the close of its fiscal year and is getting now, but, if local freight rates are advanced, as some day probably they will be, it will also get some share of the very important local freight.

Now the abstract of the report which has been published since our last issue enables us to ascertain what items of earnings have decreased most, and how much passenger and freight traffic have decreased. The earnings and expenses, in detail, for the last two years were:

| *Earnings:* | 1883-84. | 1882-83. | Decrease. | P. c. |
|---|---|---|---|---|
| Passenger | $7,533,213 | $8,526,843 | $993,630 | 11.7 |
| Freight | 16,434,983 | 20,142,433 | 3,707,450 | 18.5 |
| Other | 4,180,473 | 5,101,446 | 920,973 | 18 0 |
| Total | $28,148,669 | $33,770,722 | $5,622,053 | 16.6 |
| Expenses | 17,849,313 | 20,750,594 | 2,901,281 | 14.0 |
| Net earnings | $10,299,356 | $13,020,128 | $2,720,772 | 21.0 |

Now, before making any other comment we will do well to make the comparison with last year fairer by the light which is thrown on the great decrease in "other" earnings in a note which informs us that $641,582 received for old materials was credited to expenses last year, whereas, as the reports were made up the year before and previously it would have been given as part of the earnings. The new method of accounting for such receipts is the proper one, and is almost universally followed; but of course it affects unfavorably comparisons with the previous year, when it swelled both earnings and expenses. If we add the amount to both the gross earnings and the expenses of last year, we shall make the comparison a fair one, as follows:

| | 1883-84. | 1882-83. | Decrease. | P. c. |
|---|---|---|---|---|
| Gross earnings | $28,790,252 | $33,770,722 | $4,980,470 | 14.7 |
| Expenses | 18,490,896 | 20,750,594 | 2,259,688 | 10.9 |
| Net earnings | $10,299,356 | $13,020,128 | $2,720,872 | 21.0 |

This of course makes no difference in the net earnings, but it shows that the decrease in gross earnings was less alarming than appeared from the other comparison, and that the decrease in net earnings is not so significant of undue savings. As the receipts for materials were given with miscellaneous earnings, the comparisons of the other different items of earnings is good as reported; but all comparisons of maintenance expenses are vitiated by the change, as we have no means of knowing *how much* of these expenses last year was covered by the proceeds of old material.

In earnings from traffic we see that there was a decrease of nearly a million (11¼ per cent.) in passenger earnings and of $3,700,000 (18½ per cent.) in freight. The gross passenger earnings, however, were larger than in any previous year except 1883 and 1882, while the freight earnings were the smallest since 1877, and with one exception the smallest since 1872. For thirteen years the earnings have been:

| | Passenger. | Freight | Other. | Total. |
|---|---|---|---|---|
| 1871-72 | $6,662,007 | $16,259,647 | $2,659,022 | $25,580,676 |
| 1872-73 | 6,999,456 | 19,616,018 | 2,511,377 | 29,126,851 |
| 1873-74 | 7,497,357 | 20,348,725 | 3,804,305 | 31,650,387 |
| 1874-75 | 7,276,848 | 17,899,701 | 3,850,669 | 29,027,218 |
| 1875-76 | 6,762,967 | 17,503,265 | 3,680,357 | 28,046,589 |
| 1876-77 | 6,576,816 | 16,424,317 | 3,577,953 | 26,579,086 |
| 1877-78 | 6,022,956 | 19,045,830 | 3,841,770 | 28,910,555 |
| 1878-79 | 5,953,102 | 18,270,250 | 4,173,231 | 28,396,584 |
| 1879-80 | 6,611,150 | 22,189,966 | 4,364,788 | 33,175,913 |
| 1880-81 | 6,958,038 | 20,736,750 | 4,653,609 | 32,348,397 |
| 1881-82 | 7,816,519 | 17,672,252 | 5,140,010 | 30,628,781 |
| 1882-83 | 8,526,843 | 20,142,433 | 5,101,446 | 33,770,722 |
| 1883-84 | 7,533,213 | 16,434,983 | 4,180,473 | 28,148,669 |

Thus there was after 1874 a decrease in passenger earnings which continued till 1879, but the decrease in five years was but $1,544,000 (20 per cent.), while from 1883 to 1884 it was $933,600 (11¼ per cent.). In no previous year has the decrease been more than 8½ per cent., but the decrease in passenger earnings comes after a great and rapid increase.

The decrease in freight earnings is nearly four times as great in amount as the decrease in passenger earnings, and it is not made after the year of largest freight earnings, as in the case of passenger earnings. It is, however, not very much greater than the decrease from 1881 to 1882. But it puts the road back nearly to the position which it held in 1872 as regards freight earnings, and much further as regards freight profits. As regards the other earnings, which are those from mails, rents, pay for use of cars on connecting railroads, interest, rent of tracks, etc., the larger part of the decrease last year was due to the difference in the method of accounting for old materials sold. The decrease in the other items was about 6¾ per cent.

The decrease in expenses of about 11 per cent. is large. It is not much larger than the decrease in traffic, as we shall see, but it was much more than the decrease in train mileage, which was but 2.3 per cent. Low prices made the year favorable for reducing expenses.

How far was the great reduction of gross and net earnings caused by a smaller traffic and how far by lower rates? The traffic was:

| | 1883-'84. | 1882-83. | Decrease. | P. c. |
|---|---|---|---|---|
| Passenger-miles | 387,829,883 | 429,385,461 | 41,555,575 | 9.7 |
| Ton-miles | 1,970,087,115 | 2,200,896,770 | 230,809,665 | 10.5 |

Thus there was a decrease of about one-tenth per cent. in the total traffic, against a decrease of one-sixth in the total earnings.

Let us examine the course of the two branches of traffic for the last 12 years, given here in millions of passenger-miles and ton-miles:

| | Millions of— | | | Millions of— | |
|---|---|---|---|---|---|
| Year. | Pass.-miles. | Ton-miles. | Year. | Pass.-miles. | Ton-miles. |
| 1872-73 | 339.1 | 1,246.7 | 1878-79 | 291.0 | 2,295.8 |
| 1873-74 | 350 8 | 1,391.6 | 1879-80 | 330.8 | 2,525.1 |
| 1874-75 | 338.9 | 1,404 0 | 1880-81 | 373.8 | 2,646.8 |
| 1875-76 | 353.1 | 1,674.4 | 1881-82 | 432.2 | 2,394.8 |
| 1876-77 | 316.8 | 1,620.0 | 1882-83 | 429.4 | 2,200 9 |
| 1877-78 | 300 3 | 2,042.8 | 1883-84 | 387.8 | 1,970.1 |

We see, thus, that the passenger traffic, though 9⅝ per cent. less in 1884 than the year before, was larger than in any previous year. As it was not a year of prosperity and growing passenger traffic, we are justified therefore in the belief that the West Shore diverted comparatively little passenger traffic from the New York Central last year. Further confirmation of this is the fact that the Erie suffered a decrease of 15⅝ per cent. in its passenger traffic against the New York Central's 9⅝ per cent., which, as its local travel was not much affected by the West Shore, indicates a general decrease in travel.

The New York Central's freight traffic, which had increased almost without interruption up to 1880-81, has been decreasing ever since, and the decrease from 1883 to 1884 (231 millions of ton-miles) is not so great as that from 1881 to 1882 (252 millions of ton-miles). The latter was largely due to a failure of crops and a decreased total movement, and of the whole decrease since 1881, probably more has been diverted by the Erie than by both the new roads. The Erie has lost less, while the total traffic was decreasing, indicating that it has been getting a larger share of the total competitive traffic, for which until recently it was not fully prepared. The difference, however, is doubtless not wholly due to this, but to changes in the Erie's coal traffic, for which the New York Central does not compete. The freight traffic of two roads made in successive years (*millions* of ton-miles) has been:

| | 1878. | 1879. | 1880 | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|---|---|---|
| N. Y. Cen. | 2,042.8 | 2,295.8 | 2,525.1 | 2,646.8 | 2,394.8 | 2,200.9 | 1,970.1 |
| Erie | 1,324.8 | 1,569.2 | 1,721.1 | 1,984.4 | 1,954.4 | 1,979.4 | 1,794.9 |

Both roads reached their maximum in 1880-81. Since 1878 the Central had gained 604 millions of ton-miles; the Erie 760; but as the Central made its largest gain from 1877 to 1878, we will do better to date from 1877. From that year to 1881 the Central gained 1,047 millions of ton-miles (64 per cent.), and the Erie 870 (78 per cent.). But since 1881 the New York Central has lost 677 millions of ton-miles (25½ per cent.), and the Erie only 190¼ millions (9⅝ per cent.). There is thus reason to believe that the Erie has had a much greater effect on the New York Central's freight business than the other two roads have as yet been able to exercise. It has been a different effect, however. It has not reduced the New York Central's share of the through west-bound freight, which was divided in the old proportions until the new roads were opened; but it has been felt chiefly in the through freight eastward, which the Erie's leases, new connections and vastly increased equipment and facilities have enabled it to command.

As there was a reduction of but 20 per cent. in traffic (less than that when mails and express are included)

and a decrease of 16⅔ per cent. in earnings, there must have been a decrease in the average rates received. There was: from 1.986 cents per passenger mile to 1.942, and from 0.915 cent per ton-mile to 0.834 —2½ per cent. in the passenger rate and 9 per cent. in the freight rate. The small reduction in the passenger rate probably does not show the whole of the effect of the increased competition, though that was not great, but is due more to a large falling off in the immigrant traffic, carried at very low rates, which for some years past has been very large and has brought down the average rates of the trunk lines considerably. For successive years the New York Central's average rates have been, in cents:

| *Per mile:* | 1878. | 1879. | 1880. | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|---|---|---|
| Passenger | 2.000 | 2.050 | 1.998 | 1.862 | 1.808 | 1.986 | 1.942 |
| Ton | 0.914 | 0.796 | 0.879 | 0.783 | 0.738 | 0.915 | 0.834 |

Thus the passenger rate last year, though lower than in 1883, was higher than in 1881 or 1882; and the freight rate, though 9 per cent. less than in 1883, was 14 per cent. more than in 1882, 6½ per cent. more than in 1881, and 5 per cent. more than in 1879, and just about equal to the average of the last seven years.

It cannot be said, therefore, that last year's rates were unusually low, though there is no doubt they were much lower than they would have been but for competition for traffic, chiefly the through west-bound and the local freight. It is also to be noted that the freight carried by the new roads was chiefly of the lower classes, as has been that diverted in previous years by the Erie, so that the *proportion* of the high-class traffic on this road tends to increase, which without change in the specific rates makes the average rate higher. The freight diverted also has been nearly all through freight, which under ordinary circumstances yields much less than the average rate, and probably even last year, notwithstanding the very low local rates charged, yielded less than the average.

Some light is thrown on the nature of the traffic which has suffered the greatest decrease by the statements of "through" and "local" passengers and freight; but in these statements only the traffic passing over the line between New York and the Western termini of the road at Buffalo and Suspension Bridge is included, leaving the whole of the great New England through traffic, passing over the line between Albany and the Western termini, with the local traffic, though it, and a considerable amount of other traffic, is governed by the same rates and is affected similarly by competition as the New York traffic, and in 1880 the New York Central carried just about as many tons of it as of New York through freight. The two new roads, however, have carried but little New England traffic. Now the report shows that the "through" (New York) passenger traffic in successive years has been (number of passengers):

| 1879. | 1880. | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|---|
| 94,912 | 116,306 | 164,561 | 207,491 | 168,584 | 136,736 |

The decrease from last year is not so great as the decrease from 1882 to 1883, and might possibly be caused by the smaller immigrant traffic alone. The decrease is equivalent to 14 millions of passenger miles, which is only about one-third of the total decrease in passenger traffic.

In the New York through freight traffic the changes have been much greater. For 11 years the tons shipped through to and from New York have been:

*Tons shipped from Buffalo and Suspension Bridge to New York and from New York to Buffalo and Suspension Bridge.*

| Year. | East. | West. | Year. | East. | West. |
|---|---|---|---|---|---|
| 1873–74 | 1,166,993 | 250,173 | 1879–80 | 2,077,626 | 357,473 |
| 1874–75 | 1,074,649 | 309,260 | 1880–81 | 2,056,588 | 436,497 |
| 1875–76 | 1,338,341 | 329,586 | 1881–82 | 1,523,907 | 582,800 |
| 1876–77 | 1,218,648 | 352,820 | 1882–83 | 1,452,159 | 361,161 |
| 1877–78 | 1,883,249 | 248,402 | 1883–84 | 1,182,988 | 312,078 |
| 1878–79 | 2,100,163 | 279,757 | | | |

Thus compared with 1883 there was a decrease of 18½ per cent. in the east-bound, and of 13½ per cent. in the west-bound through freight, and the east-bound was the smallest since 1875 and the west-bound the smallest since 1879, the fluctuations in this traffic having been very great. Since 1881 the east-bound has decreased 42½ per cent., but three-fifths of it occurred between 1881 and 1882. The great west-bound traffic in 1881–82 was due largely to extremely low rates.

To compare this with the other freight (local and New England through) we have reduced it to millions ton-miles, the difference between which and the total ton-miles gives what the report calls "local" freight. The two have been for five years in *millions* of ton-miles:

| | 1880. | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|---|
| Through | 1,071.4 | 1,097.0 | 927.0 | 797.9 | 657.8 |
| Local | 1,453.7 | 1,549.9 | 1,467.8 | 1,402 0 | 1,312.3 |
| P. c. through | 42 4 | 41.5 | 38.9 | 36 3 | 33.4 |

If the New England traffic is as large in proportion to the New York traffic as when reported in 1880 (and it is probably larger), the traffic properly called through was 56 per cent. of the whole last year, against 68½ per cent. in 1880.

While the decrease in gross passenger earnings was little more than one-fourth the decrease in freight earnings, the decrease in the *profits* from passengers was greater than the decrease in freight profits. Though there was a decrease of 9⅜ per cent. in passenger traffic, there was an *increase* of 10¼ per cent. in passenger train mileage—usual where there is new competition—so that the average train-load fell from 74 to 60. The earnings per passenger train-mile fell from $1.47 to $1.17; the expenses only from 96 to 86 cents, so that the decrease in the profit was 20 cents—from 51 to 31 cents. Now the decrease of 10¼ per cent. in freight traffic was accompanied by a decrease of 9 per cent. in freight train mileage; and while there was a decrease of 18 cents in the receipt per freight train-mile, there was also a decrease of 14 cents in the expense, leaving a decrease of but 4 cents in the profit per train-mile. Multiplying the passenger and freight train mileage by the profits per train-mile, we have as the profits from freight and passengers in the two years:

| *Profit from* | 1883-84. | 1882-83. | Decrease. | P.c. |
|---|---|---|---|---|
| Passengers | $1,991,830 | $2,058,745 | $966,915 | 32 7 |
| Freight | 4,111,400 | 4,967,350 | 855,950 | 17.3 |

The report charges the whole cost of the passenger train service to passengers, leaving mails and express as net, which of course is not accurate; but it shows accurately the amount of decrease in passenger profits, which is seen to be greater than in freight profits.

For 12 years the passenger and freight profits have been (always remembering that the whole cost of passenger train service is charged to passengers):

| Year. | Pass. | Freight. | Year. | Pass. | Freight. |
|---|---|---|---|---|---|
| 1873. | $2,155,942 | $6,766,441 | 1879. | $2,469,495 | $5,649,091 |
| 1874. | 2,838,540 | 6,587,486 | 1880. | 2,441,430 | 8,560,103 |
| 1875. | 2,646,940 | 5,243,841 | 1881. | 2,413,600 | 5,715,300 |
| 1876. | 2,561,480 | 5,659,742 | 1882. | 2,778,950 | 3,382,740 |
| 1877. | 2,976,450 | 5,180,240 | 1883. | 2,958,745 | 4,967,350 |
| 1878. | 2,199,850 | 6,776,793 | 1884. | 1,991,830 | 4,111,400 |

The profits on the two kinds of traffic thus have varied greatly from year to year, and not always in the same direction.

If we go back to 1879, however, which perhaps may be considered as a normal year before the increase in the number of the trunk lines and the development of the efficiency of the Erie and the Grand Trunk as competitors for through traffic, the decrease in the passenger profits has been 19 per cent. and in the freight profits 27 per cent. The passenger rate in 1879 was a little (6 per cent.) more than last year; the freight rate a little (6 per cent.) less; the cost of working had not begun to increase.

It appears from this that $2,000,000 is all the passenger profits the New York Central has to lose. The present rates may perhaps cause it a total loss of its profits on that business; but if so it must cause a deficit to the West Shore. The Central has some passenger business not affected at all or affected but little by the competition, and from the situation of its stations is likely to have much the largest train-loads. The loss of all last year's passenger profits would have reduced the profits per share about $2.22, to $3. It may be, however, that the expenses exceed the earnings at the present rates. They must unless the cent-a-mile rate is making much larger train-loads than heretofore.

The result of the current year's operations on the New York Central's profits must have been very unfavorable down to this time, and though the promise for a profitable through traffic is fair now, the profits of the current year depend largely on the length of time the present competition with the West Shore shall continue. When it ceases, however, the diversion of traffic by the new roads will not cease, and it will probably be long before the New York Central has so large a freight traffic as in 1881 or 1882, or as large a passenger traffic as in 1882 or 1883, unless made large by such low fares as are now charged.

## THE MEXICAN RAILWAY.

The fortunes of this railroad interest us here chiefly as indicating the course of traffic in the republic, and throwing light on the enterprises in which Americans have invested many millions. The half-yearly reports are exceptionally complete in their traffic statistics, and enable us to learn what kind of traffic it is that grows larger or smaller, and on which there are changes in rates.

For eight successive half-years the course of traffic and earnings of this railroad (264 miles from Vera Cruz, with a branch 29 miles long to Puebla) has been:

| | Pass. miles. | Ton miles. | Gross earnings. | Net earnings. |
|---|---|---|---|---|
| 2d half 1880 | 7,287,971 | 9,686,024 | $1,910,722 | $1,107,402 |
| 1st half 1881 | 8,614,824 | 15,961,769 | 2,538,493 | 1,635,901 |
| 2d half 1881 | 8,419,499 | 13,274,667 | 2,396,607 | 1,490,487 |
| 1st half 1882 | 10,184,921 | 17,188,615 | 2,760,548 | 1,757,037 |
| 2d half 1882 | 9,831,566 | 21,344,879 | 3,250,737 | 2,038,017 |
| 1st half 1883 | 9,978,205 | 20,755,560 | 3,180,100 | 1,699,167 |
| 2d half 1883 | 10,133,346 | 16,471,547 | 2,530,171 | 1,404,323 |
| 1st half 1884 | 10,087,023 | 11,716,688 | 2,020,628 | 1,242,712 |

The passenger traffic, it appears, has been well maintained, and was nearly as large in the last half-year as ever before, and since the increase of 20 per cent. in the first half of 1882 has varied but little, the lightest being only 3½ per cent. less than the heaviest. But the freight traffic, which increased so greatly and rapidly after the Americans began building railroads in Mexico, has fallen off more rapidly than it grew, decreasing 43½ per cent. from the first half of 1883 to the first half of 1884, while the monthly reports of earnings show a further decrease of nearly 20 per cent. in the current half-year, which, as it is probably chiefly due to freight, indicates a large percentage of decrease in that traffic, and a movement about as small as in the first half of 1880, before the American railroad construction had had much effect on it.

The decrease in gross earnings since the first half of 1883 has been 36½ per cent. This decrease has been substantially wholly in freight earnings.

Quite as remarkable as the great decrease in freight earnings is the decrease in working expenses. This has always been one of the costliest railroads to work in the world, being $2.97 (silver) per train mile in the first half of 1883, while the average train load was the extremely small one of 58½ tons for freight trains, which were more than three times as numerous as the passenger trains, whose average load was the very large one of 90. This indicates a *cost* of about 5 cents per ton per mile.

Now, the saving of expenses effected in the last year has been considerable in amount per train mile, which was $2.24, and 24 per cent. less than in the corresponding half of last year; but it has been chiefly by a reduction of the freight train mileage no less than 43½ per cent.—from 355,243 to 200,102. This gives an average of less than two freight trains each way daily over the whole mileage worked—a little more than two every week day—while the passenger train mileage (which was as large as it had ever been) was equivalent to but 382 trains over the whole mileage during the half-year, or very little more than one each way daily. The average freight-train load was not increased (was 58½ tons), and the average passenger-train load remains unchanged at 90. Indeed, it is hard to see how it can be increased without a growth of traffic, as the train service must be now at a minimum.

The decrease in maintenance expenses is so great as to prove that the expenditures were much above the average requirements last year, or much below them this year, being at a much greater rate than the decrease in traffic and earnings. Maintenance of way and buildings cost 66 per cent. less than in 1883, and locomotive expenses 53 per cent. less, while the reduction in traffic expenses was but 21½ per cent. Repairs and renewals cost $734 (silver) per locomotive for the last half-year, $360 per passenger-train car, $23 per freight car, and for permanent way $365 per mile of road. (The amounts must be reduced about one-seventh to make the equivalent in gold.) During the period of heavy earnings extensive repairs and renewals were made, and it is probable that the expenditures on these accounts in the last half-year were much below what the average will be, with equal traffic.

The enormous rates received on this road, especially for freight, have not been decreased. The average was about 10.4 cents gold per ton (of 2,000 lbs.) per mile, in the last half year, against 10.12 in 1883. The decrease in freight traffic was 43.6 per cent.; in freight earnings, 41.9 per cent. This is remarkable because the great falling off has been in imports, which pay the highest rate. This traffic formed more than two-thirds of the whole freight traffic in the first half of last year, and fell from 13,502,000 ton-miles then to 5,339,000 this year—no less than 60 per cent. But examination shows that the average rate on this freight, which in 1883 was 11.8 cents (gold) per ton per mile, this year was no less than 14.57 cents, or 23½ per cent. more!—equal to a charge of $6.64 per 100 lbs. from New York to Chicago, to $24 from New York to San Francisco, to $3.57 cents from Chicago to Omaha or Kansas City, to $2.97 from Chicago to St. Paul, or to $1.74 from Boston to New York, which is not far from the length of the Mexican Railway. Thus the competition of the American railroads for the import traffic, of which much has been said, had not reduced the rates from Vera Cruz down to last July. It is not probable that the increase in the average rate was caused by any advance in any specific rate, but by the falling off of nearly the whole traffic in materials for railroad construction, which paid less than the average rates on imports, as may be imagined, as the import rate last year would amount to $43 per ton of rails from Vera Cruz to Mexico.

The traffic which so far shows the greatest effect from competition is that in pulque, the national beverage, which is carried chiefly from a producing district some 50 miles down the road to the city of

Mexico and other stations, there being regular pulque trains, just as there are milk trains here. A rival railroad was opened after 1882 to the pulque district, with the following result on traffic, rates and total earnings from pulque, the figures being the tons carried, etc., in the *first-half* of each of the last four years:

| | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|
| Tons ..... ..... | 33,243 | 34,183 | 31,036 | 19,028 |
| Rate per ton per mile (gold) .....10.12cts. | | 10.16 cts. | 6.24 cts. | 6.08 cts. |
| Earnings (silver)... | $187,990 | $194,105 | $113,145 | $65,115 |

Thus the competition (aided possibly by a decrease in the demand) has reduced the traffic 42¾ per cent. in three years, and the rate 40 per cent., resulting in a decrease of no less than 65 per cent. in the earnings from pulque. This is what every traffic with such enormous rates is exposed to, and when the Mexican Railway has rivals extending all the way from the city of Mexico to a Gulf port, its import rates will doubtless go the same way. There is a great deal of room for cutting a rate of 14½ cents per mile, though a railroad will need to carry a great deal more than a share of the Mexican Railway's present traffic in order to make a fair profit, even at what seems to us the very high rate of 6 cents per ton per mile. A line which is less like an elevator and more like a railroad may, however, be worked at so much less cost than the present road between Vera Cruz and Mexico as to yield a fair profit at half the Mexican Railway rate, even with a small traffic, if it is made to cost not more than $50,000 a mile or so, against nearly $140,000 represented by the Mexican Railway. There are no signs as yet that the country is developing traffic enough to support two such roads, but it is not to be expected that the present backward movement will continue, any more than that the country will grow like our Western States when first provided with railroads. We have as yet had no opportunity to know how much traffic would be developed by a moderate rate from the Gulf to the capital. The present rates are calculated to limit consumption greatly it would seem.

## Rear Colisions.

Continuing our remarks under this head, we call attention to reports of the occurrences contained in our imperfect Record of Train Accidents for October, from which it will appear that 17 out of 29 rear collisions therein noted were strictly *tail-enders*, which might have been avoided by the proper use of the simplest block signals, maintaining a positive interval between the trains which were following one another.

All of these events except one, so near as we can make out, were due to the bad dependence placed upon bad flagging. As nearly as may be gathered from the reports, at least 4 persons were killed, 31 persons were injured, 12 engines were wrecked, and 82 cars were destroyed or crippled in these disasters.

In attempting an estimate of the damages resulting from them, we shall probably fall far short of the truth, because we have no details from which we can calculate the loss of traffic suffered during the blockade of tracks resulting from a disaster of this kind, nor the cost of clearing up the wrecks, nor the injury done to the tracks, nor the value of the contents of the cars which were destroyed or injured, nor the loss which always must ensue from a destruction of confidence in the safe management of the roads upon which these collisions took place; but we have estimated these unknown quantities at the very moderate sum of $500 for each accident. The value of a human life we have taken at the rate fixed by law.

Our estimate of damages stands as follows:

| | | | | |
|---|---|---|---|---|
| 12 engines wrecked ..... | @ | $1,000 | each | = $12,000 |
| 82 cars wrecked ..... | @ | 200 | " | = 16,400 |
| 4 persons killed ..... | @ | 5,000 | " | = 20,000 |
| 31 persons injured ..... | @ | 100 | " | = 3,100 |
| Conjectural damages, 17 instances..... | @ | 500 | " | = 8,500 |
| Grand total... ..... | | | | $60,000 |

or about $3,530 for each tail-ender. From what we have personally seen of these misfortunes, we cannot regard this as probably too high an average.

Estimating the cost of a good block-signal semaphore at $75, the $60,000 which we have estimated these disasters to have cost would have furnished 800 stations with semaphores; these stations being placed five miles apart, this outlay would have provided for 4,000 miles of railroad; and, proceeding at this rate, in 30 months the entire railroad system of the United States might be equipped with suitable means of preventing this description of accident.

Or, looking at the subject in another way, if by the adoption of the very simple block system which we have described in the *Railroad Gazette* of Nov. 7, 1884, a railroad should escape one tail-ender of the average cost which we have estimated, it will have recovered the expense of equipping 47 stations, or at distances of five miles, as before, 235 miles of line. It is very clear from these figures, that a railroad, with any business worth considering, can better afford the signals than it can the tail-enders. On many roads it would perhaps not be necessary to add one man to the staff; on others it might require the addition of several night telegraphers, and on still other roads, where attention has not been paid to the advantage which may be derived from employing as agents at small stations persons who are also telegraphers, it might require the establishing of telegraph offices at points which now have to do without them. Yet, making the largest possible allowance for these contingencies, we feel assured that it would be better to meet the cost of them, than to suffer from accidents which are so clearly preventable by the adoption of the simplest precautions.

At the November meeting of the New York Car-Builders' Club a letter was read from Mr. T. B. Buchanan, of Denver, in which it was charged that it is dangerous to couple cars with the ordinary link and pin to most of the automatic couplers. On the part of the Janney coupler an answer was made to this charge in our columns afterwards. Mr. Buchanan has sent us a rejoinder to this answer, setting forth why he still believes that the Janney coupler increases the danger when it must be coupled with the ordinary link and pin coupler. It will not be possible for us to publish controversies of this kind. There are several thousands of couplers, and the owners of the patents are at this time especially interested in bringing them before the public. If a small proportion of them, even, were to set forth the advantages claimed for their inventions in these columns, there would be room for little else in the *Railroad Gazette;* if in addition each were permitted to set forth the defects of the others, the demands on our space would be immensely increased. Each of the 100 claims would open the way to 99 criticisms, and we may be permitted to remark that $99 \times 100 = 9{,}900$. If then rejoinders to the criticisms were admitted, each number of the *Railroad Gazette* would have to be a volume or an encyclopædia in extent—and, we fear, not a valuable one.

The matter at this stage is not likely to be much advanced by discussion, and certainly little weight will be given to merits or defects pointed out on paper. They must be demonstrated on the railroads, as to a considerable extent they have been and are being.

Of 49 railroads that have reported their November earnings so far, 36 have smaller ones than last year, when there had already been some decrease on many railroads. Concerning the Western railroads, not much is to be added to what we said last week. The additional reports nearly all show decreases. The Denver & Rio Grande's decrease is 11 per cent., to $377 per mile; the Denver, Rio Grande & Western decreased 16¾ per cent., to $243 per mile; the Marquette & Ontonagon falls off 50 per cent., and begins its hibernation, earning but $220 per mile: there have been months when it earned more than $2,500. The lumber roads make a not much worse showing than the average, the Detroit, Lansing & Northern losing 26 per cent., the Chicago & West Michigan, 9; the Milwaukee, Lake Shore & Western, with 22½ per cent. increase in mileage, losing 4 per cent., and the Wisconsin Central 10 per cent.

The Southern roads, for the most part, show decreases, like the rest of the country, the largest being 9½ per cent. by the Louisville & Nashville; 9 per cent. by the Mobile & Ohio, and 12 per cent. by the Norfolk & Western.

Quite as significant as any, perhaps, is the decrease of 18 per cent. by the Grand Trunk, and 24½ by the Alton & Terre Haute Main Line. No other road reporting has much trunk line through traffic. The decrease of the Grand Trunk is after a decrease of 11 per cent. in October, and a small increase last year in November.

The through shipments of freight from Chicago to the east in October last were 16 per cent. more than last year, and larger than in any other year except 1881. In November they were 12¾ per cent. more than last year and more than in any other year. In both these months there was considerable disturbance of rates this year, but some also last year, and nothing but demoralized rates in 1881. The shipments in October, November and for the 11 months ending with November have been:

| Year. | October. | November. | 11 months. |
|---|---|---|---|
| 1879..... ... ..... | 193,976 | 168,274 | 2,292,584 |
| 1880..... | 179,466 | 219,840 | 2,064,850 |
| 1881.... ... ..... .. ..... | 258,674 | 216,506 | 2,629,981 |
| 1882..... | 152,871 | 214,295 | 1,849,858 |
| 1883.... ..... .... | 198,416 | 241,577 | 2,198,799 |
| 1884..... | 229,464 | 244,496 | 2,551,964 |

The shipments for the eleven months are larger this year than in any other except 1881, the year of the great railroad war. But this was very largely due to excessively low rates, as is shown by the fact that no less than 976,909 tons were shipped in April, May and June, under a 15-cent rate, these being usually months of light shipments. Of course, with two new roads taking about one-fifth of the business, the old roads have fared worse than in most years previous to 1883.

The shipments of merchandise from New York to the West continue to be much smaller than last year. In November they were 22 per cent. less, in October 20 per cent., and in September 8 per cent. less. In the first half of the year they were about as large this year as last, and the decrease of late months is important and significant. Still the November shipments were about the same as in 1882 or 1880, though one-eighth less than in 1879, when they were swelled by forwarding great imports iron and scrap. The decrease from 1881 is about 30 per cent., but the shipments were unnaturally large then, because of the extremely low rates.

## Standard Sizes for Hexagon Bolt Heads and Nuts.

Some discussion has lately arisen on the above subject and it has been broadly stated: "That of all the manufacturers of hexagon bolt heads and nuts in the United States not one can be found who manufactures nuts and bolt heads according to the rule as given by the Franklin Institute."

It appears that the explanation of the above rather alarming and sweeping statement is very simple. The Franklin Institute recommended certain proportions for the screw threads, nuts and heads of bolts of specified diameters. The United States Navy Department adopted the forms and proportion of screw-thread recommended which is generally known as the Sellers thread and about which there need be no further question. It is obviously more important to have a uniform system of screw-threads than to have a uniform size for nuts. If a bolt under an engine or a car requires a nut, generally speaking it matters little whether that nut is square or hexagon, finished or rough; so long as the screw-threads fit, the nut can be screwed up tight. And practically a nut tapped to the Sellers thread will fit a bolt screwed to the Whitworth thread, the difference in the form of the top and bottom of the thread, and the incline of the thread being too slight to make an appreciable difference in the fit of ordinary bolts and nuts. The number of threads is alike in all sizes in most general use, except the ⅛ in., where the Sellers system of threads has 13 threads per inch and the Whitworth 12. As far, therefore, as the screw-threads are concerned, the continued use of the barbarous vee thread is the only grievance of which the advocates of standards can reasonably complain.

A far greater diversity exists in the sizes of bolt-heads and nuts. In the first place different individuals and trades require, or think they require, widely different sizes of nuts for the same diameter of bolts. Messrs. Hoopes & Townsend, for instance, find that their customers call for a great variety of nuts to screw on a ¾ in. bolt. The smallest of these nuts measures only 1⅛ in. over the flats, and the largest 2 in. Yet the user of the former size says that a ⅝ in. nut is quite large enough for a ¾ in. bolt, and the user of the chunk of bar iron 2 in. square and ¾ in. thick finds that no other form or size of nut will suit his ¾ in. bolts. Between these two extremes are other shades of opinion differing from one another only by sixteenths.

But there is, beyond this, another reason for the uncertainty which prevails regarding the standard sizes of nuts. The Franklin Institute recommended that finished nuts should be of a certain size and that black, rough or unfinished nuts should be $\frac{1}{16}$ in. larger than the finished nuts. The United States Navy Department adopted the sizes given for rough nuts as their standard size for all nuts, whether rough or finished. This fact is not generally borne in mind. Hence some, like Mr. C. E. Simonds, complain that manufacturers do not adhere to "the United States and Franklin Institute Standard." The fact is that the Franklin Institute has two standards, one for rough and one for finished sizes, and the United States government, or rather one government department, has adopted one of these standards as applicable to all bolt-heads and nuts, whether rough or finished.

It is therefore, we think, evident that the present diversity of practice is not the fault of bolt and nut makers, but is due to the diverse opinions held by users of nuts as to what the proper size of a nut for their particular class of machinery should be. Some consider that a rough nut made to the size prescribed by the Franklin Institute for finished nuts is large enough for their purpose. While this opinion is carried into practice by many machine tool makers, makers of locomotives hold very generally that a finished nut should be made of the size used in the United States Navy and recommended by the Franklin Institute as the size for rough or unfinished nuts.

The matter is somewhat further complicated by the want of a general understanding as to what constitutes the difference between a rough and a finished nut. Messrs. Hoopes & Townsend, and we believe other bolt and nut makers, consider that a finished nut is one finished exactly to size all over by the action of cutting tools. Some users of nuts, on the other hand, simply face a cold punched nut on the top and bottom, smooth the faces by a touch on the grindstone and consider the product a finished nut.

It is evident that the smallest nut that will efficiently do

the work is, on the whole, the most advisable to use. It takes up the least room, and therefore permits the bolts being placed more advantageously on flanges, etc., and as it is smaller it costs less and effects a further saving in many instances by diminishing the amount of metal or space that has to be provided to carry it. If there is no practical disadvantage in using small nuts their use would certainly seem advisable. In one case brought under our notice nuts shaped outside to the Franklin Institute size for finished nuts for 1 in. bolts were used for 1¼ in. bolts with perfectly satisfactory results.

The depth of bolt-heads is another subject on which some diversity of practice exists. The Franklin Institute here recommended different proportions for rough and finished heads. The height of the head for the rough bolt is one half the diameter of the nut across the flats, while the head for the finished bolt equals the diameter minus one-sixteenth. The result of this proportion is that the finished head is for the large sizes deeper than the rough head, while for very small bolts the rough head is the deeper. The depth of the head of a bolt is not a very important dimension; but if made too great, it weakens rather than strengthens the bolt, as, in making the bolt, the end is apt to be burnt before the shank has arrived at a welding heat. If, on the other hand, the shank is not hot enough, it will not upset properly at the junction of the shank and head, and the metal is nicked there and apt to break.

## Corn and Traffic.

The November report of the Department of Agriculture gives estimates of the average production of corn per acre in the principal corn states, and confirming its former estimate that the production of the whole United States is somewhat in excess of 1,800 millions of bushels, which compares as follows with the production of previous years, given here in *millions* of bushels:

| 1879. | 1880. | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|---|
| 1,759 | 1,717 | 1,194 | 1,617 | 1,551 | 1,800 |

There must be, during the coming year, and doubtless for some time afterwards, a considerable addition to railroad traffic due to the large increase in this crop over any of the three years previous, and it interests us to know where that increase may be expected. Multiplying the Department's estimates of average yield per acre by its estimates of the acreage issued in July, we have the following as the production of the seven great corn states, compared with previous years:

| Year. | Ohio. | Indiana. | Illinois. | Three east of Miss. |
|---|---|---|---|---|
| 1884 | 89,125,000 | 104,748,000 | 244,530,000 | 438,403,000 |
| 1883 | 73,560,000 | 95,620,000 | 203,786,500 | 372,966,500 |
| 1882 | 93,319,200 | 107,484,300 | 182,336,900 | 383,140,400 |
| 1881 | 79,760,000 | 79,618,000 | 176,733,000 | 336,111,000 |
| 1880 | 119,940,000 | 99,229,000 | 240,452,000 | 459,621,000 |
| 1879 | 111,877,100 | 115,482,300 | 325,792,500 | 553,151,900 |

| Year. | Iowa. | Missouri. | Kansas. | Nebraska. | Four w. of Miss. |
|---|---|---|---|---|---|
| 1884 | 255,550,000 | 203,864,000 | 180,693,000 | 118,041,000 | 758,145,000 |
| 1883 | 169,626,000 | 161,655,000 | 172,800,900 | 101,278,900 | 601,363,800 |
| 1882 | 175,487,600 | 170,937,000 | 144,452,600 | 82,478,200 | 572,455,400 |
| 1881 | 173,289,000 | 93,069,000 | 76,377,000 | 58,913,000 | 401,648,000 |
| 1880 | 230,192,800 | 164,533,400 | 106,218,300 | 59,507,600 | 586,332,100 |
| 1879 | 275,024,200 | 202,485,700 | 105,729,300 | 65,450,100 | 648,689,300 |

This makes the aggregate production of these seven corn states, for the six years, as follows, in *millions* of bushels:

| 1879. | 1880. | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|---|
| 1,202 | 1,046 | 737¾ | 955½ | 978⅛ | 1,196½ |

—showing that they produced 66½ per cent. of the corn of the country this year, which is a larger proportion than in any other year except 1879, when it was 68 per cent.

Taking the group as a whole, therefore, the production this year, though 22 per cent. more than last year, 25 per cent. more than in 1882, and 62 per cent. more than in the very bad year 1881, is a trifle less than in 1879, and but 14 per cent. more than in 1880.

The great increase in production is west of the Mississippi. There only is the yield per acre large this year (ranging from 34 to 38½ bushels in the different states), and there is the great increase in acreage. In 1879 the three states east of the Mississippi had 15,980,000 acres of corn and 48 per cent. of the acreage in the seven states; in 1884 they had but 14,638,000 acres, and but 41 per cent. of the acreage in the seven states. On the other hand, the four states west of the Mississippi have increased their area in corn from 17,223,000 acres in 1879 to 21,147,000 in 1884. The average yield per acre was 23⅛ bushels east of the Mississippi in 1879 and 37⅜ west of it—extraordinary yields in both cases; this year the average yield is 30 bushels east of the Mississippi, and 36 bushels west of it.

The result is that the three states east of the Mississippi this year produced 115 millions of bushels of corn (20 per cent.) *less* than in 1879, and but 65½ millions (17½ per cent.) more than last year, while the four states west of the Mississippi produced this year 109½ millions (17 per cent.) *more* than in 1879, as well as 153 millions (25 per cent.) more than last year.

It appears, however, that the progress has not been great in all of these four states. In Iowa, the greatest of them all, the production this year is not only less than in 1879 (as in the states east of the Mississippi), but less also than in 1880, and in Missouri the increase over 1879 is insignificant. Reports had indicated that the condition of corn in Iowa this year was so good that it could not well be better; but the Department now reports an average yield of but 35 bushels per acre there, against 41½ in 1879 and even 38 in 1880. The increase over 1879 in this district is substantially all due to the extension of corn-growing in Kansas and Nebraska—the extreme western corn states, in the western one-fourth or one-third of which corn-growing is not practicable to any extent. In these two states the production for successive years has been, in *millions* of bushels:

| 1879. | 1880. | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|---|
| 171 | 165½ | 135⅛ | 227 | 274 | 298¾ |

But for these two border states, therefore, the corn production of the seven corn states, instead of being but 6 millions less this year than in 1879, would have been 134 millions less. In 1879 they produced but 14¼ per cent. of the total of the corn states; in 1884, 25 per cent. In Kansas the increase has been 71 per cent.; in Nebraska, 80 per cent.

If we wish to ascertain the probable effect of the new crop on railroad traffic, however, we must not go back so far as 1879. Naturally we compare with our most recent experience, and if we do this we find that Kansas and Nebraska have less to gain than the other states, simply because they had good crops last year and the year before, when further east corn was a poor crop; and as then corn was high, and the general abundance this year has made it low, the somewhat smaller crop of last year doubtless was worth a great deal more to Kansas and Nebraska than the larger one this year, and on the whole made more traffic for the railroads, which depends so much on the profits of the farmers, as well as their production. We have a gain over last year in corn production of 16¾ millions (16¼ per cent.) in Nebraska and 8 millions (4½ per cent) in Kansas, which makes but a little figure compared with the increase of 42 millions (25 per cent.) in Missouri and 86 millions (50 per cent.) in Iowa, or even with the gain of 40¾ millions (20 per cent.) in Illinois.

It is these three states, Iowa, Missouri and Illinois, which have made the great gains over last year, aggregating 169 millions of bushels (from 535 to 704 millions, or 31½ per cent.), and where the chief effect of the better crop should be expected. Two-thirds of the whole reported increase of production over last year of the whole United States has been in these three states, and virtually much more, for it was in them that the chief reduction in the quality of the corn occurred last year, caused by the early frosts. In Iowa especially the gain is immense, 50 per cent. in quantity, and a very large percentage in quality.

There is a great improvement, of course, in the states north of those we have called the "corn states," but their total production is comparatively insignificant, and whether good or bad has little effect on traffic. In 1883, for instance, the aggregate production of Michigan, Wisconsin, Minnesota and Dakota was but 65,031,000 bushels. This year the report indicates their production to be about 89,000,000 bushels. The increase of 24,000,000 is a very large percentage indeed (37 per cent.), but in amount it is not one-third as great as the increase in Iowa alone, and not one-half more than the increase from one large crop to another large crop in Kansas and Nebraska.

These states, indeed, are not nearly so important as some of the Southern States. Indeed, Kentucky and Tennessee have claims to be considered among the great corn states, as they produce this year about 75 millions and 65 millions of bushels respectively, against 78 and 64 millions last year. The increase, aside from that in the 11 upper Mississippi Valley states just mentioned, amounting to 80 million bushels, was chiefly in the other Southern states, there being no increase in New England, a gain of 4½ millions (26 per cent.) in New York and 5⅓ millions (15 per cent.) in Pennsylvania. It is not easy to understand from the report where it can be, however. Nine of the states which produce most, reported as producing 338 million bushels last year, shows an aggregate production of 341 millions this year, gains of 4 millions in Virginia, of 6¾ millions in Georgia and of 4 millions in Alabama, being offset by losses of a million in Maryland, 1⅓ millions in Louisiana, 7 millions in Texas and 3 millions in Kentucky.

This accounts for but 3 millions of an increase of 70 millions, and leaves the remainder to come from New Jersey, Delaware, West Virginia, the Carolinas and Arkansas, as the territories and the Pacific coast produce so little of this grain that it is not worth while to take them into account—last year only 2,050,000 bushels.

It is apparent that the gains which will be felt are nearly all in what we have called the seven corn states; the South altogether producing about the same amount as last year, and the gains in the East not making an appreciable addition to the national supply.

## Erie Earnings and Expenses in October.

The New York, Lake Erie & Western Railroad reports for October, the first month of its fiscal year, a greater decrease in gross and net earnings than in any other month except August and March, the earnings and expenses of the Erie proper having been:

| | 1884. | 1883. | Decrease. | P. c. |
|---|---|---|---|---|
| Gross earnings | $1,511,159 | $1,983,468 | $472,309 | 23.8 |
| Expenses | 932,497 | 1,196,344 | 263,847 | 22.0 |
| Net earnings | $578,662 | $787,124 | $208,462 | 26.5 |

The gross earnings for the month were $221,580 less than in September, while in the first four years after the reorganization the October earnings were the larger, and in 1882 they were but $61,000 and in 1883 $136,000 less in October than in September. The net earnings in October were $267,700 less than in September, but they were very much the largest of the year in September.

There was a *profit* of $49,181 on the lease of the New York, Pennsylvania & Ohio Railroad last October, against a profit of $56,245 last year. The profit this year, added to the net earnings, makes $627,842, which is about one-fifth more than the average monthly fixed charges (apart from guarantees of Chicago & Atlantic, etc.), these fixed charges last year having been at the rate of $512,250 per month. The net earnings usually are above the average of the year.

For the eight years since the reorganization the earnings and expenses of this railroad in October have been:

| Year. | Gross earnings. | Expenses. | Net earnings. |
|---|---|---|---|
| 1877 | $1,535,343 | $930,790 | $604,553 |
| 1878 | 1,473,532 | 854,055 | 619,487 |
| 1879 | 1,713,697 | 997,995 | 715,722 |
| 1880 | 1,899,910 | 1,013,406 | 886,504 |
| 1881 | 1,814,866 | 1,189,188 | 625,678 |
| 1882 | 1,819,010 | 1,175,681 | 643,329 |
| 1883 | 1,983,468 | 1,196,345 | 787,123 |
| 1884 | 1,511,159 | 932,497 | 578,662 |

Thus the gross earnings this year were less than in any other except 1878, the working expenses less than in any except 1877 and 1878, and the net earnings smaller than in any other without exception, though when the profits on the New York, Pennsylvania & Ohio are added, they are a little larger than in 1877 or 1878.

The specially unfavorable circumstances of the month were the low passenger rates, which have continued since, and a demoralization of through east-bound freight rates during part of the month.

The earnings and expenses of the New York, Pennsylvania & Ohio for the month were:

| | 1884. | 1883. | Decrease. | P.c. |
|---|---|---|---|---|
| Gross earnings | $524,556 | $628,939 | $104,383 | 16.6 |
| Expenses | 307,517 | 371,434 | 63,917 | 17.2 |
| Net earnings | $217,039 | $257,505 | $40,466 | 15.7 |

The decrease both in gross and net earnings was much less on this road than on the Erie proper, and the gross earnings were but $32,000 (6 per cent.) less than in 1882 and larger than in any previous year, while the net earnings were much larger than in any year before 1883, though this may have been partly due to a difference in the method of charging them, provided for in the lease. The net earnings were less in October than in September, but much more than in any other month of 1884.

The incomplete report of the through and local shipments of grain, flour and provisions from Chicago, for the week ending Dec. 13 and for corresponding weeks of three previous years, give the totals, in tons, as follows:

| 1881. | 1882. | 1883 | 1884. |
|---|---|---|---|
| 43,889 | 52,642 | 54,535 | 65,356 |

Thus the shipments this year were 20 per cent. more than last year and still more than in 1881 and 1882, and were among the largest ever made in a winter week, exceeded only in a few weeks of March and April in two or three years.

| | Week ending. | | | | | |
|---|---|---|---|---|---|---|
| *Tons:* | Nov. 8. | Nov 15. | Nov.22. | Nov.29. | Dec.6. | Dec 13 |
| Flour | 7,899 | 9,465 | 11,999 | 10,820 | 10,910 | 15,036 |
| Grain | 31,419 | 37,819 | 32,530 | 25,174 | 29,167 | 35,812 |
| Provisions | 8,262 | 10,272 | 12,560 | 13,500 | 15,399 | 14,508 |
| Total | 47,580 | 47,548 | 57,089 | 49,494 | 55,476 | 65,356 |
| *Per cent.:* | | | | | | |
| C. & Grand T | 8.7 | 5 5 | 4.8 | 8.4 | 14.2 | 15.4 |
| Mich. Cen | 22 6 | 27.4 | 27.6 | 27.3 | 24.8 | 24.0 |
| Lake Shore | 20.2 | 17 4 | 20.4 | 20.4 | 7.3 | 13.9 |
| Nickel Plate | 8.5 | 12 8 | 16.0 | 14 6 | 12.7 | 13 9 |
| Ft. Wayne | 9.1 | 11.4 | 11.0 | 9.7 | 18.6 | 12.0 |
| C., St. L. & P | 8.4 | 7.7 | 7.5 | 4.4 | 6.9 | 4.8 |
| Balt. & Ohio | 4.4 | 5.7 | 4.7 | 3.2 | 6.4 | 5.6 |
| Ch. & Atlantic | 18.1 | 12.5 | 8 0 | 12.0 | 9.1 | 10.3 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100 0 |

In this statement, the figures for the week to Dec. 6 differ considerably from those published last week.

The gain last week over the week before was 38 per cent. in flour and 42 per cent. in grain. There was a small decrease in provisions.

The percentages indicate that the Grand Trunk is doing something to make up for its shortage in the pool, but the Michigan Central still gains, and the two Pennsylvania roads are far behind. The Chicago & Grand Trunk carried 30⅓ per cent. of the provisions last week, the Fort Wayne 17.7 per cent., the Michigan Central 17 per cent., the two Pennsylvania roads 26.9 per cent. The Chicago & Atlantic had 41 per cent. of the flour and the Michigan Central 22 per cent.; the three Vanderbilt roads carried 65.4 per cent. of the grain. These very large shipments of special commodities by a single line usually occur when there has been cutting of rates, but it is affirmed that they were well maintained last week.

The grain receipts of the Northwestern markets in the first week of December—the first week after the close of lake navigation, which formerly greatly reduced the movement—were the largest ever known at this season, amounting to 7,035,117 bushels. We will compare this with the largest receipts in any week while navigation was closed, in previous winters, as follows:

| Week ending | | | | |
|---|---|---|---|---|
| Dec. 18, '80. | Jan. 28, '82. | March 3 '83. | Dec. 8, '83. | Dec. 6, '84. |
| 5,012,357 | 5,297,541 | 6,531,960 | 6,509,543 | 7,035,117 |

The wheat receipts were extraordinarily large in this week, and so were the corn receipts, the latter amounting to nearly 2,400,000 bushels, which is extremely large for the season. The imperfect reports for the week to Dec. 13 indicate a great decrease of corn receipts, but large wheat receipts.

New Orleans has not made much of a figure as a grain receiving port since harvest. During the four months beginning with August and ending with November, its receipts have been, in bushels:

| 1880. | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|
| 6,001,942 | 2,329,235 | 5,111,460 | 3,990,834 | 2,969,057 |

Thus the receipts this year were one fourth less than last year, 43 per cent. less than in 1882, 27 per cent. more than in 1881, and not half as great as in 1880. The large decrease in exports accounts largely for the decrease since 1880.

The closing of canal navigation is signalized by a very great decrease in the wheat receipts of New York. These

had averaged 1,230,000 bushels per week through November, and were 1,151,000 in the last week of that month, but in the first week of December they fell to 301,125 bushels. This is the more noticeable, because usually canal boats continue to arrive after the canal has closed, the Hudson River being open for all boats that got through the canal at Troy. In other grains the decrease was not so marked, but the total New York grain receipts fell from 2,840,665 bushels in the last week of November to 1,544,931 in the first week of December, which is 46 per cent. The close of navigation of course does not affect the other Atlantic ports in the same way. There was a large gain at Boston and at Baltimore, and no considerable loss anywhere except at New York and New Orleans.

A report has been made of the Illinois Central's earnings on its Illinois and Southern divisions separately, for the eleven months ending with November, showing for that time a much smaller decrease on the Southern Division than on the Illinois or Iowa lines. For seven years the gross earnings of this Southern Division for the 11 months have been:

| | | | |
|---|---|---|---|
| 1878 | $2,363,159 | 1882 | $3,245,941 |
| 1879 | 2,853,723 | 1883 | 3,847,017 |
| 1880 | 3,251,556 | 1884 | 3,728,625 |
| 1881 | 3,593,398 | | |

Thus the earnings this year were much larger than in any other except last year.

The Illinois lines have not done so well, their earnings for the eleven months having been:

| 1879. | 1880. | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|---|
| $5,190,012 | $6,006,759 | $6,150,869 | $6,387,016 | $6,170,443 | $5,644,362 |

Thus the earnings of these lines this year were not only 8⅓ per cent. less than last year, but were 11⅝ per cent. less than in 1882, and the smallest since 1879.

With the Iowa leased lines the case has been worse as compared with last year, which, however, was the year of their largest earnings. For the eleven months their earnings have been:

| Year. | Earnings. | Year. | Earnings. |
|---|---|---|---|
| 1873 | $1,521,131 | 1879 | $1,388,387 |
| 1874 | 1,476,301 | 1880 | 1,624,872 |
| 1875 | 1,679,086 | 1881 | 1,672,055 |
| 1876 | 1,513,310 | 1882 | 1,788,652 |
| 1877 | 1,378,439 | 1883 | 1,866,356 |
| 1878 | 1,420,231 | 1884 | 1,558,376 |

These Iowa lines thus earned less this year than in any other since 1879, and less than in 1875 even. For railroads in a new country, as these were when completed about 1879, these roads have made less progress than any others in the Northwest that we know of. The country on the western two-thirds of the line from Dubuque to Sioux City, in Northwestern Iowa, resolutely refused to grow until about 1880, and then when people began to fill it up so as to make it produce a traffic sufficient to double or treble the Illinois Central's earnings on that line, it was gridironed with new railroads, which have multiplied much more than the population and the production of the country. Some of them only got fairly to work this year, and so helped to arrest the growth of earnings, which had been considerable since 1879. They only helped, however, for the greater part of the decrease probably was due to last year's early frost, which hurt corn more on the Illinois Central's Iowa lines than on any other road, probably, entirely ruining the larger part of it. The part of the road from Iowa Falls to Sioux City, in the newer country, 184 miles long, has earned but $3,274 per mile this year, and the 75½ miles of the branch from Cedar Falls north to the Iowa line, which passes through a comparatively old country, only $1,507 per mile during the 11 months.

In our issue of Aug 29, we mentioned that a train of 105 cars had been hauled on Morgan's Louisiana & Texas Railroad by a Baldwin American type locomotive with 16 × 24 cylinders and 62-in. drivers, and weighing about 66,000 lbs.; about 43,000 lbs. of which are on the drivers. The following additional particulars are contained in letters from Mr. J. Kruttschnitt, Superintendent of the line:

"The engine has the extended front and straight stack and feed water heater, and during the trip the pressure did not vary five pounds from 130 lbs. The engineer had no trouble in starting, and was anxious to try five oreten more cars. In warm weather similar engines often take 50 to 80 loaded cars. The track from 19-mile switch to Algiers is perfectly level, with the exception of about one mile, which is on a grade of 5.28 ft. to the mile. Our regular freight, run with engines of the same class, is from Algiers to Lafayette, 144 miles, which they make in about 13 hours. They have to surmount two grades of 21 ft. to the mile, 3,000 and 2,000 ft. long respectively, and numerous grades of 17.6 ft. to the mile. The engines pull the trains over these grades without the least trouble, making the schedule time with but very rare exceptions.

"On August 6, 1884, a special freight was run, consisting of 7 20-ton loaded cars, 26 12-ton loaded cars, 49 10-ton loaded cars, 6 10-ton empty cars, 17 20-ton empty cars; total, 105 cars, 1 caboose."

This train apparently could have weighed little short of 2,000 tons. Allowing 3.5 lbs per ton for train resistance on the level, and 2 lbs. per ton for gravity on the grade of 5.28 ft. per mile, the total resistance would be 11,000 lbs. As the engine has only a tractive power of 99 lbs. for every pound per square inch average pressure on the pistons, a pressure of 111 lbs. per square inch in the cylinders throughout the stroke would just enable the train to surmount the incline. In starting, the friction would not apparently have exceeded 6 lbs. per ton, as 6¼ lbs. would give a total resistance of 12,500 lbs., which would only be overcome by an average pressure in the cylinders of 127 lbs., only 3 lbs. below the full boiler pressure. The back pressure and compression would certainly exceed this amount. The whole performance speaks well for the good condition of the engine, the cars, and the track.

### Record of New Railroad Construction.

Information of the laying of track on new railroads is given in the present number of the *Railroad Gazette* as follows:

*Indiana, Alabama & Texas.*—Track is reported laid from Clarksville, Tenn., north by west 10 miles.

*Talladega & Coosa Valley.*—Extended northward to Moxley, Ala., 2 miles.

*St Louis, Fort Scott & Wichita.*—Extended from Clearwater, Kan., southwest to Springdale, 14 miles.

This is a total of 26 miles of new railroad, making 3,652 miles reported to date for the current year. The total track reported laid to the corresponding date for 13 years past is as follows:

| | Miles. | | Miles. |
|---|---|---|---|
| 1884 | 3,652 | 1877 | 1,094 |
| 1883 | 5,997 | 1876 | 2,278 |
| 1882 | 9,799 | 1875 | 1,333 |
| 1881 | 7,808 | 1874 | 1,844 |
| 1880 | 5,087 | 1873 | 3,630 |
| 1879 | 3,643 | 1872 | 7,160 |
| 1878 | 2,263 | | |

These statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

## NEW PUBLICATIONS.

*Biographical Directory of the Railway Officials of America.* Published by the *Railway Age*, Chicago.

This work, we are informed, will probably be ready for issue this week. It will contain an alphabetically arranged list of general and division railroad officers in the United States, Mexico and Canada, with the official address of each and a brief history of his railroad career. Portraits of a few prominent men will also be given. The idea of the book is an excellent one, and if the execution is equal to the promise, it cannot fail to be a most convenient book of reference. It is intended to revise and extend the book at the close of each year hereafter.

*The Materials of Engineering.* By Robert H. Thurston, A. M., C. E., Professor of Engineering, Stevens Institute of Technology, Past President Am. Soc. Mech. Engineers, etc., etc. Published by John Wiley & Sons, New York. 1883.

The first thing that strikes one in attempting to lift the three by no means large volumes which constitute this important work is their enormous weight. It would certainly appear that the materials of engineering books require some investigation. Either the paper on which several recent books have been printed is largely mixed with lead, or the book is composed of so many hundred pages of lead mixed with a little paper. It quite creates a sympathy with the poet who wrote:

> Home-made bread,
> A heavy compound of putty and lead.

On laying the book down on some substantial support and opening it, the first unfavorable impression subsides, and we soon discover that the three volumes contain a very complete and thorough treatment of a very important subject on which the author is specially qualified to speak, as he has conducted many experimental researches on the strength of materials in directions where additional information was much needed.

The first volume treats of non-metallic materials—stone, timber, fuel, lubricants, etc. Small illustrations are given of the most useful kinds of forest trees. The varieties of pines and fir trees might have been more clearly shown, as considerable confusion often exists in the nomenclature of these trees, owing to the difference between the various kinds of pines being difficult to distinguish. The author alludes to this and says: "The Canadian red pine (*Pinus resinosa*) is wrongly called in various localities "Norway pine" and "Yellow pine." Speaking of the *Southern pine*, "Long-leafed pine" (*Pinus australis, Pinus palustris*), the author says: "Its name is very commonly confused with that of the pitch pine." Some of this confusion would be prevented if the author had informed his readers clearly of the essential differences by which these pines may be distinguished.

The chapters devoted to the strength of timber treat the subject very fully, and give some new and interesting facts as to the gradual decrease in the strength of timber under a long-continued strain.

The question of the relative value of lubricants is handled in a very clear and intelligible form, and a machine for testing oils for use on car-axle journals is illustrated and described.

The volume concludes with several tables for the conversion of metric into Anglo-Saxon measures, four figure logarithms, and an explanation of the C. G. S. system of units.

We regret that we must postpone for the present any notice of the two succeeding volumes, which treat of Iron and Steel and the Non-Ferrous Metals and Alloys.

### The Elements of Railroading.

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VI.—TELEGRAPH—FENCES.

The telegraph has become the indispensable ally of the railroad; by its aid the capacity of a single track is doubled, and that of a double track may be very much increased; aside from its use in the movement of trains, it facilitates the rapid transaction of business to such an extent that it has become quite as important an aid to the commercial as to the operating department.

It has been sometimes attempted, even upon roads of considerable traffic, to do the business of all departments upon a single wire, no doubt from a mistaken idea of the capacity of the wire rather than from a failure to appreciate the advantages of a prompt service. It would be a grave error to allow any other business to hinder the dispatching of trains, or even to interrupt it; for it will not do to confuse a telegrapher, during the transmission or receipt of train orders, by hurrying him with other matters.

It is best for a new road to build its own telegraph line, and to operate it, at first; in the rapid construction of a new road, it would be found of great advantage to erect the line as soon as possible after the location of the road had been finally determined; for the benefit derived from constant and instantaneous communication with headquarters would more than pay the extra cost of building it without the aid of railroad transportation. If the line were not too long, it could be temporarily equipped with telephones instead of telegraphic instruments, which would postpone the employment of skilled telegraphers for a while; a distance of one hundred miles or more can be talked through very satisfactorily at the present time; and with the improvements which are announced every few days, we may expect to talk well through a thousand, before long. The cost of building a telegraph line is not very considerable for a railway company, and a better bargain with any telegraph company for connections, for interchange of business, or for operating the line jointly with the railway, can be made after the telegraph line is completed than before. It should, however, be a thoroughly well built line, upon the best model up to date. The poles are larger and longer on the best lines, the wires are of greater diameter and of better material than they were a few years ago. This is the result of a long experience with lines of an inferior character; they cost more to keep in repair than good lines and were not to be relied upon. The size of the poles is perhaps the most important feature of a new line; for that limits the number of wires which can be strung upon them, and, as it is very sure that they will be loaded to their full capacity within a few years, it is best to set up those of the largest size which are now used in the best practice of the older telegraph companies. Cedar poles are regarded as best of all; white oak, chestnut and yellow pine are very good, where more conveniently obtained. The standard length of telegraph poles was formerly 24 ft.; it was found that after the part in the ground had decayed, that which had been above ground was still good. This led to the adoption of 30 ft. as the usual length, permitting the poles to be cut off at the ground when decayed, and to be reset. From 32 to 36 poles per mile is the number required. On some roads the telegraph poles serve as mile-posts, boards with the proper figures upon them being nailed to the post which is nearest to the mile-stake. By attention to this in building the telegraph line, or by resetting the poles at the mile stakes, the position of these could be cheaply perpetuated and the cost of mile posts avoided. If, then, the intermediate posts were somewhat carefully spaced, they would be of very great convenience as reference stakes for the track department; if those at the mile stakes were to be painted white for their whole length, and those at the half and quarter miles for only a part of their length, they would afford a scale of distances which could be read in passing at the highest speeds, and be of value to the officers of the road in many ways.

The ordinary cross-arm is calculated for six wires; if it is probable that arrangements will be made with a telegraph company for connections and for the use of the railroad's right of way, it will be wise to put a second cross-arm on the poles before they are set, and to have the *gains* cut in the poles for a third cross-arm; for such work can be more easily done before the poles are set than after.

But these remarks are not applicable to an obscure branch line in an unsettled country, where possibly a single wire will serve the railway and telegraph companies both, for some years.

When possible, the poles should be set more than their length from the main track, so that if they should fall from any cause they will not obstruct it. If there are more passenger stations upon one side of the line than the other, it will save crossings of the tracks, which are objectionable, if the poles are set upon the station side. In marshes it is frequently difficult to maintain a telegraph pole erect because of the softness of the ground. This can generally be accomplished by sinking a barrel without any head where the pole is to stand, then setting up the pole inside the barrel and filling between the pole and barrel with gravel or small stones.

Insulators of many varieties have been experimented with, and there are several especially fitted for peculiar situations; nothing has been found to be better for general use than the cylinder of glass screwed on to an oaken pin, a coarse thread being molded in the glass to correspond with a similar one on the pin.

No. 9 wire was formerly universally used for telegraphic purposes, now No. 6 has the preference for long lines and No. 4 has its advocates; this refers to iron wire, of which none but the very best is fit. There are several kinds of wire of greater conductivity invented and experimented with; none established as equal to iron for main lines, as yet.

It is not intended to treat of the manifold applications of electricity to railway working; words would be wanting to represent their value and convenience; space would be lacking in which to simply mention their variety; there are excellent books on train-dispatching, on block-signaling and many other special uses which should be studied by those who wish to be informed. Unfortunately, the currents from a battery are not of sufficient strength to do much work; they can sound a bell or move a hand upon a dial, conveying almost any information by concerted signals; they may be arranged to set other more powerful forces at

work at any distance, and in this way render very important service in signaling. It should be oftener remembered that we have at hand this power of notifying in advance the approach of trains, whenever it can contribute to safety or convenience to do so; and at a trifling cost, even by means which are automatic, so that there is no attendant required. The incessant whistling in great yards might be totally dispensed with, and much more certain information conveyed by a line of bell signals at the switchmen's cabins. Telephones should communicate between the offices and the principal points in all important yards and termini; indeed, they can scarcely be placed upon a railway where they will not repay their cost by facilitating the transaction of business.

In the construction of its telegraph line a railroad company will need the services of experienced men, as well as in its use and maintenance afterwards. The setting of the poles, the stringing of the wires and other particulars of the work can be accomplished by experts in a fraction of the time that persons without practice would require. As in all other departments the first requisite is an energetic superintendent who thoroughly understands the details of the building and testing of a line, as well as the art of telegraphing. It will be of great advantage if he also knows something of modern progress in electrical science.

Telegraph offices should be well lighted by night, which is much neglected, as well as by day; and they should be well ventilated, because there are fumes from all varieties of moist batteries, which taint the air in addition to the ordinary causes of vitiation; they should be contrived so as to exclude the public and loafers from the apartments in which are the operators and the messages. Upon railroads, there is a disposition among all classes of employés to make the telegraph office a sort of club-room, probably because they can there learn the latest news; and on the part of the telegraphers there is a natural inclination to relieve the tedium of their office hours by social chat. It is, however, due to the accuracy and privacy of this most important mode of correspondence and of giving orders, that the telegraph office shall be entered only by the telegraphers; as little as possible even by the higher officials, who can set a good example by remaining outside, unless they must enter upon business.

This is not the proper place in which to discuss the unfairness of the statutes in regard to fencing, which, in most of the states of this Union, throw the burden entirely upon the railroads in opposition to the common law, and compelling the railroads to build fences, professedly to insure the safety of trains, allow the farmer's cattle to pervade the highways and to frequent the railroad crossings by day or night, without responsibility on the part of the owners for damages to property or for the destruction of human life, which may result from their neglect to keep their beasts confined. If the railway companies were themselves to give attention to this matter, it is scarcely doubtful that they might, in the interest of safety to trains, secure legislation which would prevent animals from frequenting the railroad crossings; at least an enactment such as that which was passed in Canada at the suggestion of the Railroad Commissioners, prohibiting the loosing of cattle, at large, within two miles of any railroad.

Fences are not a very important item in the first cost, nor in the annual accounts of a railroad, if originally well built and afterwards well maintained; but if improperly built or if neglected, so as to be chargeable with the payments on account of stock killed, they become a formidable source of expense.

At the present time there is no variety of fence which can compare in suitableness for a railroad with that of barbed wire; which is as cheap as any good fence, easily built, neat in appearance, not likely to be set on fire, sure not to spread fire, does not harbor weeds, occupies the minimum of space, does not cause drifts of snow, and is a thoroughly satisfactory fence against all but the most unruly animals and sheep. The introduction of extra wires, tying all together by vertical stays between the posts, would probably make it sufficient to exclude sheep; but their thick fleeces render them insensible to the barbs which secure the fence from the assaults of other animals. Until the farmers shall have used the barbed wire fence for their own fields, as they will do more and more, there will be instances of the mutilation of stock because of the animals' unfamiliarity with the fence; and where it is new to them, it is desirable that they shall have a cautious introduction to it; if led up and caused to examine it and to prick their sides and noses a few times against it, they will avoid it as carefully as a burned child does the fire.

The usual height of a *lawful fence* is 4½ ft.; if an animal jumps over such a fence the law considers it to have violated propriety and will hold the railway company guiltless if it be killed in consequence; but the owner of the beast will seek for a place in the fence which is less than the full height, and, if such is found, will probably recover damages, upon a verdict of his countrymen. To avoid contentions of this kind, and because a high fence offers less temptation to a jumping beast than a low one, it is recommended to make railroad fences several inches higher than the legal standard, although this will require five wires instead of four; these should be fastened to the sides of the posts furthest from the tracks.

The barbed wire, when properly strained, stands so firmly on few posts that there is a temptation to use fewer of these than experience will justify. The wire manufacturers, in order to cheapen the cost of this fence in comparison with other varieties, encourage a reduction in the number of posts used; 15 ft. between posts is better than a longer distance, although many recommend and use spaces of 20 ft. and more. The life of a fence is in its posts; the more durable they are, the less the fence will cost per year for maintenance; of common woods, cedar, locust, chestnut, white oak, are relatively valuable, in the order named, for fence posts; it is preferable to have them peeled before setting; to be permanent they must enter the ground at least 3½ ft. in this climate, because of frost. There are various ways in which the life of wooden fence posts may be prolonged, as by charring the part which enters the ground; or by coating it with hot coal tar, if the wood is seasoned, or still better by burnetizing, kyanizing, or, best of all, creosoting them. These processes of injecting the wood with preservative substances will render almost every wood suitable for fence posts and nearly imperishable; and as no wear and tear is endured by them as there is by sleepers, the whole value of the preservative process may be realized when applied to fence posts. There are promising devices for iron posts to hold barbed wires; it is likely that, with the cheapening of iron and with some modifications in design as experience will suggest, they will become useful, and perhaps supplant the wooden posts, where timber is not abundant. When wooden posts are pointed at the bottom, they are thrown up out of the ground by the action of the frost, and it is presumable that the *pointed* cast-iron footings which have been proposed for iron posts, will be acted upon in the same way; they ought, it is concluded, to be largest at the bottom.

The wires of the fence must be kept very taut; and, in order to maintain the necessary strain, it must be thoroughly braced at all the openings and corners; the strains upon the wires and the diagonal bracing have a tendency to raise the braced post, which should therefore be anchored; a cheap mode of doing this is by spiking a piece of board cross-wise on each side of the post, at the bottom.

One of the cheapest possible forms of gate is also the best for use at *farm* crossings; it is made of four horizontal strips of fencing united by two vertical strips at each end and two in the middle, well nailed together with clinched nails. This should run back and forth, with the bottom of the top strip resting on a pin, between two posts set near together at one side of the opening in the fence. When half open, if the posts are set right, the gate can be swung half round, nearly at right angles with the line of the fence, leaving a clear opening of the width of the gate. In the post against which the free end of the gate shuts, there should be a hook on which to hang it when closed; the hook-headed track spike answers very well for this, but the post must be bored to receive it, to avoid splitting. CHARLES PAINE.

## TECHNICAL.

### American Society of Civil Engineers.

At the regular meeting of Nov. 19, a paper was read by Edmund B. Weston, giving a description and the results of some experiments that were made to ascertain the force of water ram that could be generated above the static pressure in water-pipes under various conditions. The experiments were made at Providence, R. I.

A note on a method for increasing the accuracy of a system of magnetic bearings of a survey, by Olin H. Landreth, was read.

Suggestions for Flattening the Ends of Railroad Curves, by Albon P. Man, Jr., were read. The formulas given, partially adopted from Rankine, are as follows:

For speed of 40 miles per hour, the length of the adjustment curve equals 25 to 30 times the degree of curvature (the sum of degrees if reversed curves, the difference if compound). Taking this length at a convenient even number of feet, the shaft for each curve will be 8 times the square of the length of the adjustment curve, multiplied by the degree of curvature, divided by 1,100,000.

The deflection distance of the adjustment curve at any point, distant ($x$) from the end of the adjustment curve, will be 4 $x^3$ multiplied by the shift, divided by the cube of the length of adjustment curve:

At the regular meeting of Dec. 3 a communication from the Civil Service Commission of the state of New York was presented, requesting a conference in reference to standards of qualification for the several grades of engineers and their subordinates employed by the state. The communication was referred to the board of direction with power to act.

A collection of samples of building materials used in ancient Rome, presented to the society by Sig. Felice Ciccoretti, a distinguished architect of Rome, was exhibited.

A paper by A. M. Wellington, upon Experiments with New Apparatus on Journal Friction at Low Velocities, was discussed.

### A Large Snow Plow.

The Buffalo Car Works have just completed a snow-plow for the Rochester & Pittsburgh road, which is one of the largest ever built. The plow is carried on two pair of trucks, is 15 ft. high from the rail to the elevated deck, 33 ft. long, and weighs 58,500 lbs., being weighted with 1,700 ft. of old rails. Its sides are 14 in. in thickness, and the frame is of great weight and solidity. On top of the plow is a cupola or observatory large enough to hold two persons, and underneath is a room fitted with windows, which is capable of accommodating ten people, and heated with a stove. The lining of the plow is cased in front with heavy sheet-iron, and back of the room or caboose is a wrecking derrick.

# General Railroad News.

## MEETINGS AND ANNOUNCEMENTS.

### Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

*Boston & Albany*, annual meeting, at the Meionaon in Boston, at 11 a. m., Feb. 11, 1885.

*Oregon & California*, special meeting, in Portland, Or., Dec. 22.

*Philadelphia & Reading*, annual meeting, at the office in Philadelphia, Jan. 12, 1885. The registry of stock closed Oct. 12.

### Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

*Boston, Revere Beach & Lynn*, 3 per cent., semi-annual, payable Jan. 1, to stockholders of record, Dec. 20.

*Central, of Georgia*, 3 per cent., semi-annual, payable Dec. 27. The June dividend was 2½ per cent., and the December dividend last year 3½ per cent.

*Manhattan*, 1½ per cent., quarterly, payable Jan. 2. Transfer books close Dec. 20.

*Northern Central*, 4 per cent., semi-annual, payable Jan. 15. Transfer books close Dec. 31.

*Richmond & Petersburg*, 2½ per cent., semi-annual, payable Jan. 1.

*Wilmington, Columbia & Augusta*, 3 per cent., semi-annual, payable Jan. 10.

### Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Master Car-Builders' Club* will hold regular meetings at its rooms, No. 113 Liberty street, New York, on the evening of the third Thursday in each month. The next regular meeting will be on Thursday, Jan. 15.

The *New England Railroad Club* will hold its regular meetings at its rooms in the Boston & Albany station in Boston, on the evening of the third Wednesday in each month. The next meeting will be held Wednesday, Jan. 14.

The *Western Railway Club* will hold regular meetings at its rooms, No. 103 Adams street, Chicago, on the third Wednesday in each month.

### Foreclosure Sales.

The *Rio Grande & Pecos* road will be sold under foreclosure Dec. 17, under an order of the United States Circuit Court. The road runs from Laredo, Tex., along the Rio Grande to the coal mines, 27 miles. It has never been profitable and the floating debt has been continually increasing ever since it was opened. The minimum price fixed by the Court is $100,000.

### Cleveland, Columbus, Cincinnati & Indianapolis Railway Mutual Insurance Association.

The annual meeting of this association was held in Galion, O., last week, about 80 delegates being present. The reports presented showed that the Association is in a prosperous condition. It now numbers about 1,500 members.

### Master Car Painters' Association.

The following circular has been issued by Mr. R. McKeon, of Kent, O., the Secretary:

"By advice of the President and Vice-President, your Secretary has corresponded with all active members of this Association who were present at the late convention in Boston, in relation to changing the next place of meeting from Montreal to Toronto. Replies have been received from nine-tenths of the number, and all, with but two exceptions, have voted for the proposed change.

"Therefore, in view of this almost unanimous expression, I would give notice that the next annual convention of the Association will be held at Toronto, Canada, the first Wednesday in September, 1885."

## ELECTIONS AND APPOINTMENTS.

*American Society of Civil Engineers.*—At the monthly meeting on Dec. 3, the following candidates were elected members: Frederic Vaughan Abbot, Fernandina, Fla.; Henry Smith Craven, Tarrytown, N. Y.; James Dudley Hawks, Detroit, Mich.; John Thomas Heathorn, Providence, R. I.; Frank Wellington Hodgdon, Boston; Charles Vernon Mersereau, St. Louis; Albert Franklin Noyes, West Newton, Mass.; Pedro J. Sosa, Panama, U. S. of Colombia; Charles Jeptha Hill Woodbury, Boston. As juniors: Loomis Eaton Chapin, Toledo; Harold Edward de Raasloff, New Tacoma, Wash. Ter.; Roger Tappan, Haverhill, Mass.

*Atlantic & Pacific.*—Mr. John L. Truslow has been appointed General Western Passenger Agent, and will have charge of passenger business on the Pacific Coast, with office in San Francisco.

Mr. W. A. Bissell is appointed Pacific Coast Freight Agent for the company and the Atlantic & Pacific fast freight line, and will have charge of freight matters on the Pacific Coast with office in San Francisco.

*Baltimore & Ohio.*—The following appointments in the passenger department have been announced to take effect on Dec. 15: B. F. Bond, Division Passenger Agent, territory Main Stem Division, including east-bound business from Wheeling—office, Baltimore; W. E Reppert, Division Passenger Agent, territory Trans-Ohio Division, including westbound business from Wheeling, but not the city of Chicago—office, Columbus, O.; E. D. Smith, Division Passenger Agent, territory Pittsburgh Division, including east-bound business from Wheeling *via* Pittsburgh—office, Pittsburgh; C. E. Dudrow, Traveling Passenger Agent, territory east of Martinsburg, but not the cities of Washington and Baltimore—office, Staunton, Va.; E. E. Patton, Traveling Passenger Agent, territory east of and including Grafton, Connellsville and Martinsburg—office, Cumberland, Md.; Albert Koenig, Traveling Passenger Agent, territory west of Connellsville and east-bound business from Washington, Pa.—office, Pittsburgh; John T. Lane, Traveling Passenger Agent, territory west of Washington, Pa., and Grafton, also Parkersburg Branch and Cambridge, O.—office, Wheeling, W. Va.; James M. Orr, Traveling Passenger Agent, territory west of Cambridge, O., including Tiffin and Sandusky, O.—office, Columbus, O.; P. E. Dombaugh, Traveling Passenger Agent, territory west of Tiffin, but not including the city of Chicago—office, Fostoria, O.; John R. Malloy, Traveling Passenger Agent, territory Columbus & Cincinnati Midland, including the city of Columbus, Ohio.

*Boston & Maine.*—The following is a list of the officers, including all the changes made in consequence of the Eastern lease: James T. Furber, General Manager; Lucius Tuttle, Assistant to General Manager; William Merritt, Jr., Superintendent Western Division; D. W. Sanborn, Superintendent Eastern Division; John W. Sanborn, Superintendent Northern Division; D. J. Flanders, General Passenger and Ticket Agent; W. J. C. Kenney, General Freight Agent; William F. Berry, Assistant General Freight Agent; Amos Blanchard, Treasurer; A. Perkins, Fuel Agent; William Smith, Superintendent of Motive Power; D. C. Richardson, Master Car-Builder; John Bailey, Master of Maintenance of Way, Western Division; A. Bissell, Master of Maintenance of Way, Eastern Division.

*Charlotte, Columbia & Augusta.*—At the annual meeting in Columbia, S. C., Dec. 4, the following were re-elected: President, A. C. Haskell; Vice-President and General Manager, A. L. Rives; Superintendent, G. R. Talcott; Auditor, John Craig; Treasurer, J. C. B. Smith; Traffic Manager, Sol Haas; General Freight Agent, J. H. Drake; General Passenger Agent, M. Slaughter; Assistant General Freight and Passenger Agent, D. Pardwell.

*Cleveland, Columbus, Cincinnati & Indianapolis Railway Mutual Benefit Association.*—At the annual meeting in Galion, O., last week, the following officers were chosen: President, Robert Blee; Treasurer, T. J. Higgins; General Secretary, G. W. Burt.

*Des Moines Union.*—The officers of this new company are: President, G. M. Dodge; Vice-President, James F. How; Secretary and Treasurer, F. M. Hubbell. Office at Des Moines, Iowa.

*Fort Worth & Denver.*—At the annual meeting in Fort Worth, Tex., Dec. 10, the following were elected directors: W. A. Ross, Morgan Jones, J. W. Swayne, J. P. Smith, Fort Worth; D. Felsenheld, J. T. Granger, T. W. Pearsall, New York; W. T. Walters, Baltimore. The directors elected as officers: President, Morgan Jones; Vice-President, T. W. Pearsall; Secretary, W. A. Ross; Treasurer, J. T. Granger.

*Hartford & Connecticut Western.*—At the annual meeting in Hartford, Conn., Dec. 16, the following directors were chosen: Wm. H. Barnum, E. T. Butler, R. B. Carpenter, Charles J. Cole, Thomas Cornell, L. Dunning, W. L. Gilbert, C. P. Hillyer, A. H. Holley, John F. Jones, L. B. Merriam, Frederick Miles, Joseph Phelps.

*Knox & Lincoln.*—The new board has elected J. T. Berry President; Edmund Wilson, Clerk; F. H. Low, Treasurer; C. H. Coombs, Superintendent.

*Maine Central.*—At the annual meeting in Augusta, Me., Dec. 17, the following directors were elected: Abner Coburn, Darius Alden, George C. Lord, Joseph Ricker, Amos Paul, William B. Bacon, Frank Jones, Samuel C. Lawrence, Thomas W. Hyde, Arthur Sewall, William C. Davis, Horatio N. Jose, and John Ware. The board elected Arthur Sewall President in place of George E. B. Jackson, who declined a re-election.

*New York & New England.*—The new board has elected Wm. T. Hart President, and Messrs. Higginson, Leith, Martin, Blake and Tower, Finance Committee, with power to act on the floating debt.

*New York, Pennsylvania & Ohio.*—General Manager Felton recently issued the following order:

"On and after Dec. 1 the superintendents on their respective divisions will have charge of the maintenance of track, bridges and buildings, in addition to their present duties. In the performance of their duties each superintendent will be aided, when necessary, by an assistant engineer, who will report direct to him. The title of Chief Engineer will be changed to Engineer Maintenance of Way. The Engineer Maintenance of Way will assist the General Manager in all maintenance of way matters and shall have charge of all important construction work, the preparations of plans of new structures, the charge of original maps and profiles of the road, and shall perform such other duties as may from time to time be assigned to him. The title of General Master Mechanic will be changed to Superintendent Motive Power, the duties will not be changed."

*Northern Central.*—Mr. F. P. James, of Baltimore, has been chosen a director in place of S. M. Shoemaker, deceased.

*Ohio & Mississippi.*—The board has elected George S. Morison and F. P. Dimpfel directors, in place of T. Harrison Garrett and Edward Higgins, resigned.

*Petersburg.*—At the annual meeting in Petersburg, Va., Dec. 16, the following were chosen: President, Major E. T. D. Myers; Directors, R. R. Bridgers, D. W. Lassiter, B. F. Newcomer, Frederick R. Scott, W. T. Walters. The board afterwards elected H. Walters General Manager; R. M. Sully, Superintendent; Alexander Hamilton, Counsel.

*Philadelphia & Atlantic City.*—Mr. W. Bertolet has been appointed Superintendent, to take effect Dec. 15, vice Mr. F. S. Urie, resigned.

*Pontiac, Oxford & Port Austin.*—At the annual meeting recently, the following directors were chosen: Hugh Porter, G. W. Debevoise, Samuel O. Rowe, Frank H. Carroll, Charles A. Carpenter, Abram W. LeRoy, James Houston, C. J. Whitney. The board elected G. W. Debevoise President; Charles A. Carpenter, Vice-President; Frank H. Carroll, Secretary and Treasurer; James Houston, General Superintendent. The offices are in Pontiac, Mich., except that of the President, which is in New York.

*Port Jervis & Monticello.*—Mr. Frederick J. De Peyster, of New York, has been appointed Receiver. He is a director and Acting President of the company.

*St. Louis, Alton & Terre Haute.*—Mr. R. M. Pringle has been appointed Master Mechanic of the roads operated by this company, to succeed A. M. DeClercy, deceased. Appointment to take effect from Dec. 4. All communications pertaining to that department should be addressed to Mr. R. M. Pringle at East St. Louis, Illinois.

*Tioga & Elmira State Line.*—This company (controlled by the New York, Lake Erie & Western) has elected John King President; L. H. Shattuck, General Superintendent; C. C. Drake, General Agent. The office of Vice-President and General Manager is abolished.

*Wabash, St. Louis & Pacific.*—Mr. John Lange has been appointed Superintendent of Car Department for all lines west of the Missouri River. Office at Moberly, Missouri.

*Western North Carolina.*—At the annual meeting last week at Salisbury, N. C., the old board was re-elected, and all the old officers were also re-elected, as follows: President, A. B. Andrews: First Vice-President, Frank Coxe; Second Vice-President, A. L. Rives; Superintendent, E. V. McBee; Secretary and Treasurer, G. P. Erwin; Chief Engineer, J. W. Wilson.

## PERSONAL.

—Mr. F. S. Urie has resigned his position as Superintendent of the Philadelphia & Atlantic City road.

—It is said that Mr. J. W. Griffith will succeed Mr. George W. Hall as Assistant Auditor of the Union Pacific Co. on Jan. 1 next.

—Mr. George W. Hall has resigned his position as Assistant Auditor of the Union Pacific Co. after 17 years' service in that department.

—Mr. Wallace Pratt, General Attorney for the Kansas City, Fort Scott & Gulf Co., was married in New York, Dec. 11, to Mrs. Caroline Dudley, formerly of Buffalo.

—Mr. Frank C. Smith has accepted the position of Superintendent of the Locomotive Improvement Co., at Toledo, O. The company rents locomotives, and manufacture a traction device and other railroad appliances.

—Conductor A. T. Patton, who has been running a passenger train on the Illinois Central for 30 years, will be 70 years old next March, when he expects to quit railroading. During his long career as a conductor not a single passenger on his train has been killed or injured.

—Mr. Charles G. Lincoln, who was three weeks ago chosen Treasurer of the New York, Lake Erie & Western Co., died in New York, Dec. 16, aged 55 years. He was born in Vermont and lived in California a number of years. He was for many years associated in business with the late Trenor W. Park, and was Treasurer of the Hudson Tunnel Co. for some time.

—Mr. George B. Parsell, for many years connected with Missouri railroads, died in St. Louis Dec. 10, in his 62d year. Mr. Parsell, who was engaged early in life as a civil engineer in the construction of the New York & Erie road, came to Missouri in 1855. After being for some time employed as location and construction agent of the Missouri Pacific and San Francisco roads, he subsequently served as Division Superintendent on the Pacific and Iron Mountain roads, and more recently on the Kansas City & Northern. He was for several years a resident of Webster Groves, near St. Louis, and a prominent member of the Congregational church there.

## TRAFFIC AND EARNINGS.

### Cotton.

Cotton movement for the week ending Dec. 12 is reported as follows, in bales:

| | 1884. | 1883. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| *Interior markets:* | | | | |
| Receipts | 184,421 | 155,049 | I. 29,372 | 18.7 |
| Shipments | 164,989 | 131,280 | I. 33,709 | 25.7 |
| Stock, Dec. 12 | 335,451 | 410,246 | D. 74,795 | 18.2 |
| *Seaports:* | | | | |
| Receipts | 289,457 | 281,163 | I. 8,294 | 2.9 |
| Exports | 205,548 | 110,276 | I. 95,272 | 86.4 |
| Stock, Dec. 12 | 968,206 | 1,169,764 | D. 201,558 | 17.2 |

The total movement from plantations for the crop year (from Sept. 1) to Dec. 12 is estimated at 3,695,299 bales; the increase, as compared with last year, is 19,026 bales, as compared with 1882 is 126,775 bales, and with 1881 is 178,644 bales.

The weather continues to be quite favorable to the movement of the crop, and in consequence it is being freely marketed.

### Buffalo West-bound Passenger Rates.

At a meeting held at the office of the Chairman, New York, Dec. 6, the following roads were represented: New York, Lake Erie & Western, John N. Abbott; Michigan Central, O. W. Ruggles; Grand Trunk, W. Edgar.

The following resolutions were adopted:

"*Whereas*, The trunk lines have agreed to discontinue the use of low rates to the West except upon continuous train tickets, with a view to protect the revenues of their Western connections,

*Resolved*, That with the concurrence of the Lake Shore & Michigan Southern Railway Co., the following rates be made for continuous train tickets only, taking effect at the commencement of business Monday, Dec. 8, 1884, from Buffalo, Niagara Falls and Suspension Bridge to Chicago: First class, $10; Second class, $8.

"The usual differentials to apply. Agreed rates for unlimited tickets remain unchanged."

No advices were received from the Lake Shore & Michigan Southern Railway Co., until Dec. 8, when notice that the rates agreed to would take effect at once was immediately given to the parties interested.

### Grain Movement.

For the week ending Dec. 6 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eleven years:

| Year. | Northwestern receipts. | Northwestern shipments. | Atlantic. receipts. |
|---|---|---|---|
| 1874 | 2,247,072 | 636,161 | 1,261,514 |
| 1875 | 2,129,850 | 742,915 | 1,835,211 |
| 1876 | 2,732,511 | 1,380,152 | 2,246,464 |
| 1877 | 2,808,567 | 1,172,719 | 2,463,069 |
| 1878 | 3,834,457 | 1,453,904 | 3,097,492 |
| 1879 | 3,611,180 | 869,673 | 2,703,737 |
| 1880 | 4,852,388 | 1,181,301 | 3,699,096 |
| 1881 | 3,178,051 | 1,926,288 | 2,302,700 |
| 1882 | 5,266,647 | 2,032,704 | 3,401,907 |
| 1883 | 6,509,543 | 2,377,659 | 3,249,754 |
| 1884 | 7,035,217 | 2,635,809 | 3,183,842 |

Thus the receipts of the Northwestern markets for this week were larger than in the corresponding week of any previous year. They were also 996,000 bushels more than in the previous week of this year, and the largest since October. The gain over the previous week was 23¾ per cent. at Chicago, 26 per cent. at Milwaukee and 41 per cent. at St. Louis. The receipts at Duluth were large, though navigation was closed.

The shipments of these markets were also larger than in the corresponding week of any previous year. Of these, 310,069 bushels went down the Mississippi, which is the largest amount for three months.

The Atlantic receipts for the week were slightly less than in the corresponding week of last year, and less than in 1882 or 1880, but larger than in any other year. They were the smallest this year since the middle of July.

Exports from Atlantic ports for this week to Dec. 6 have been:

| | 1880. | 1881. | 1882. | 1883. | 1884. |
|---|---|---|---|---|---|
| Flour, bbls | 173,369 | 58,504 | 242,268 | 205,254 | 181,433 |
| Grain, bu | 2,366,470 | 1,042,508 | 1,204,208 | 1,870,289 | 1,804,335 |

The exports were slightly less than last year, but much more than in 1881 or 1882, and about one-sixth less than in 1880.

San Francisco exports for the California crop year from July 1 to Dec. 1, five months, were as follows, flour in barrels and wheat in bushels, flour being reduced to wheat in the totals:

| | 1884. | 1883. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Flour | 492,220 | 572,590 | D. 80,370 | 14.0 |
| Wheat | 10,858,112 | 10,805,925 | I. 52,187 | 0.5 |
| Total | 13,319,212 | 13,668,875 | D. 349,663 | 0.5 |

Exports of California barley by sea for the five months to Dec. 1 were: 1884, 269,967; 1883, 113,205; increase, 156,762 centals, or 138.5 per cent.

### Boston Traffic Notes.

During the month of November, 6,911 loaded freight cars went through Hoosac Tunnel eastward, against 8,022 for the corresponding month last year, a decrease of 1,111.

### California Through Freights.

Shipment of through freight eastward from California points by rail for September and the nine months ending Sept. 30 were, in tons:

| | Central Pac. | So. Pacific. | Total. |
|---|---|---|---|
| September | 9,358 | 8,586 | 17,944 |
| Nine months | ..... | ..... | 108,346 |

In September the Central Pacific carried 52 per cent. of the total tonnage, and the Southern Pacific 48 per cent.

### Minnesota Iron Ore.

The Duluth & Iron Range road was completed to the iron mines on Vermilion Lake, Minn., Aug. 17. From that date to Oct. 31 the Minnesota Iron Co. shipped over the road and by lake from its southern terminus at Two Harbors, Lake Superior, 62,105 tons of iron ore. Next season the company will be ready to make large shipments of this ore, which will come into competition with that from the Upper Peninsula of Michigan.

### Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

| | 1884. | 1883. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| *Eleven months ending Nov. 30:* | | | | |
| Ala. Gt. South | $1,007,761 | $962,834 | I. $44,927 | 4.6 |
| Cin., N. O. & T. P. | 2,362,710 | 2,361,508 | I. 1,202 | 0.1 |
| Cleve., Ak. & C. | 443,601 | 490,047 | D. 46,446 | 9.5 |
| Ev. & T. Haute | 693,905 | 670,440 | I. 23,465 | 3.5 |
| Ft. Worth & D. | 432,734 | 356,460 | I. 76,274 | 21.8 |
| Grand Trunk | 15,657,590 | 17,669,770 | D. 2,012,180 | 11.4 |
| G. B., W. & St. P. | 297,420 | 374,495 | D. 77,075 | 20.6 |
| Ind., Bloom. & W. | 2,446,020 | 2,724,720 | D. 278,700 | 10.2 |
| Kansas City, Ft. Scott & Gulf | 2,180,644 | 1,792,314 | I. 388,330 | 21.7 |
| Kan. City, Spr. & Mem | 1,076,847 | ..... | ..... | ... |
| Marq., H. & O. | 801,280 | 879,899 | D. 78,619 | 8.9 |
| N. O. & Nor'east. | 439,771 | 119,987 | I. 319,784 | 266.5 |
| Norfolk & West. | 2,449,536 | 2,570,381 | D. 120,845 | 4.7 |
| Peoria, Dec. & E. | 701,854 | 658,305 | I. 43,549 | 6.6 |
| St. L., A. & T. H.: | | | | |
| Main Line | 1,200,630 | 1,347,821 | D. 147,191 | 10.9 |
| Belleville Line | 679,515 | 758,359 | D. 78,844 | 10.4 |
| St. L., Ft. Scott & Wichita | 445,937 | 246,433 | I. 199,534 | 81.0 |
| Shenandoah Val. | 683,951 | 791,402 | D. 107,451 | 13.6 |
| Vicksburg & Mer. | 441,867 | 460,697 | D. 18,830 | 4.1 |
| Vicks., S. & P. | 236,116 | 119,343 | I. 116,773 | 97 9 |
| Wisconsin Cent. | 1,337,854 | 1,356,890 | D. 19,036 | 1.4 |
| *Ten months ending Oct. 31:* | | | | |
| Bur., C R. & No. | $2,233,876 | $2,277,365 | D. $43,489 | 1 9 |
| Net earnings | 668,191 | 667,705 | I. 486 | 0.1 |
| Cin., Ind., St. L. & Chi | 2,035,374 | 2,094,165 | D. 58,791 | 2.8 |
| Net earnings | 760,854 | 775,192 | D. 14,338 | 1.8 |
| Des M. & Ft. D. | 290,862 | 276,101 | I. 14,761 | 5.4 |
| Net earnings | 85,790 | 75,893 | I. 9,897 | 13.0 |
| N. Y., L. Erie & Western | 17,089,597 | 19,884,155 | D. 2,794,558 | 14.5 |
| Net earnings | 4,134,411 | 6,358,759 | D. 2,224,348 | 34.2 |
| Utah Central | 868,513 | 973.9 9 | D. 105,486 | 11.8 |
| Net earnings | 397,327 | 502,823 | D. 105,438 | 21.0 |
| *Nine months ending Sept. 30:* | | | | |
| Wab., St. L. & P. | $12,109,987 | $12,117,226 | D. $7,239 | 0.1 |
| Net earnings | 2,069,210 | 2,278,498 | D. 209,288 | 9.2 |
| *Month of October:* | | | | |
| Cin., Ind., St. L. & Chi | $241,145 | $249,507 | D. $8,362 | 3.3 |
| Net earnings | 91,287 | 87,065 | I. 4,222 | 4.9 |
| N. Y., L. Erie & Western | 1,867,857 | 2,411,146 | D. 543,289 | 22.5 |
| Net earnings | 627,842 | 843,368 | D. 215,526 | 25.5 |
| *Month of November:* | | | | |
| Ala. Gt. South | $122,944 | $108,838 | I. $14,106 | 12.9 |
| Cin., N. O. & T. P. | 225,268 | 234,425 | D. 9,157 | 3.9 |
| Cleve., Ak. & Col. | 37,545 | 41,175 | D. 3,630 | 9.3 |
| Denver & R. G. Western | 89,555 | 107,686 | D. 18,131 | 16.8 |
| Ev. & T. Haute | 60,094 | 59,737 | I. 357 | 0.6 |
| Ft. Worth & D. | 35,589 | 44 214 | D. 8,625 | 19.6 |
| Grand Trunk | 1,340,164 | 1,638.973 | D. 298.809 | 18.2 |
| G. B., W. & St. P. | 29,547 | 47,831 | D. 18,284 | 38.1 |
| Ind., Bloom. & W. | 218,060 | 235,972 | D. 17,912 | 7.6 |
| Kansas City, Ft. Scott & Gulf | 200,550 | 193,555 | I. 6,995 | 3.6 |
| Kan. City, Spr. & Mem | 137,227 | ..... | ..... | ... |
| Marq., H. & Ont. | 30,300 | 60,129 | D. 29 829 | 49.7 |
| N. O. & Nor'east. | 91,124 | 38,362 | I. 52,762 | 137.4 |
| Norfolk & West. | 230,297 | 261,636 | D. 31,339 | 12.0 |
| Peoria, Dec. & E. | 58,983 | 60,609 | D. 1,626 | 2.6 |
| St. L., A. & T. H.: | | | | |
| Main Line | 98,768 | 131,522 | D. 32,754 | 24.4 |
| Belleville Line | 60,689 | 74,961 | D. 14,272 | 19.0 |
| St. L., Ft. Scott & Wichita | 41,524 | 38,234 | I. 3,290 | 8 7 |
| Shenandoah Val. | 48,124 | 78,628 | D. 30,504 | 38.6 |
| Vicksburg & Mer. | 54,037 | 59,009 | D. 4,972 | 8.4 |
| Vicks., Shreve. & Pacific | 55,133 | 21,443 | I. 33,690 | 157.0 |
| Wis. Central | 124,799 | 138,805 | D. 14,006 | 10.1 |
| *First week in December:* | | | | |
| Canadian Pacific. | $130,000 | $94,000 | I. $36.000 | 38.3 |
| Chi. & Alton | 179,839 | 192,138 | D. 12,299 | 6.4 |
| Chi. & East. Ill. | 40,226 | 42,942 | D. 2,716 | 6.3 |
| Chi., Mil. & St. P. | 536,000 | 514,848 | I. 21,152 | 4.1 |
| Chi. & Nor'west. | 489,700 | 485,900 | I. 3,800 | 0.8 |
| Chi., St. P., Min. & O. | 121,000 | 109,300 | I. 11,700 | 10.7 |
| Cin., Ind., St. L. & Chic | 46,340 | 40,110 | I. 6,230 | 15.5 |
| Louis. & Nash. | 309,555 | 290,705 | I. 18,850 | 6.5 |
| Mil., L. S. & W. | 21,650 | 20,895 | I. 755 | 3.6 |
| Roch. & Pitts. | 23,532 | 20,116 | I. 3,416 | 17.0 |
| St. L. & San F. | 98,700 | 96,600 | I. 1,100 | 1.1 |
| Wab., St. L. & P. | 371,000 | 370,816 | I. 184 | .... |

Weekly earnings are usually estimated in part, and are subject to correction by later statements.

### Coal.

Coal tonnages for the week ending Dec. 6 are reported as follows:

| | 1884 | 1883. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| Anthracite | 688,378 | 663,683 | I. 24,695 | 3.7 |
| Eastern bituminous | 191,589 | 194,712 | D. 3,123 | 1.6 |
| Coke | 57,092 | 63,081 | D. 5,989 | 9.5 |

It is still reported that the anthracite combination will be broken by the Reading Co., the Receivers being convinced that a large traffic at lower rates will be more for the interests of the property than a restricted output sold at higher prices. The Receivers have so far declined to give any official statement of their views, and their action next year is uncertain.

Cumberland coal shipments for the week ending Dec. 13 were 47,996 tons. Total shipments for year to Dec. 13 were: 1884, 2,768,595; 1883, 2,412,686; increase, 355,909 tons, or 14.8 per cent.

The coal tonnage of the Pennsylvania Railroad for the week ending Dec. 6 was:

| | Coal. | Coke. | Total. | 1883. |
|---|---|---|---|---|
| Line of road | 167,894 | 51,538 | 219,432 | 202,052 |
| From other lines | 82,259 | 5,554 | 87,813 | 74,341 |
| Total | 250,153 | 57,092 | 307,245 | 276.393 |
| Total to Dec. 6 | 9,721,418 | 2,672,444 | 12,393,862 | 11,618,539 |

Increase for the week, 30,852 tons, or 11.2 per cent.; for the year, 775,323 tons, or 6.7 per cent.

The anthracite coal tonnage of the Lehigh Valley Railroad for the fiscal year ending Nov. 30 was:

| | 1884. | 1883. | Inc. or Dec. | P. c. |
|---|---|---|---|---|
| Wyoming District | 1,440,925 | 1,431,150 | I. 9,775 | 0.7 |
| Hazleton | 2,385,415 | 3,028.037 | D. 642,622 | 21.2 |
| Beaver Meadow | 724,436 | 557,203 | I. 167,233 | 30.0 |
| Mahanoy | 1,458,223 | 1,511,522 | D. 53,299 | 3.5 |
| Total | 6,008,999 | 6,527,912 | D. 518,913 | 7.9 |

Actual tonnage passing over the Pennsylvania & New York road for the fiscal year ending Nov. 30 was:

| | 1884. | 1883. | Inc. or Dec. | P.c. |
|---|---|---|---|---|
| Anthracite | 1,251,409 | 1,262,785 | I. 88.624 | 7.0 |
| Bituminous | 302,100 | 331,114 | D. 29,014 | 8.8 |
| Total | 1,653,509 | 1,593,899 | I. 59,610 | 3.7 |

The larger part of the anthracite is received from the Lehigh Valley road, of which this road is an extension.

Anthracite coal tonnage for November and the eleven months ending Nov. 30 is reported as below by Mr. John H. Jones, the Official Accountant, the statement including the

entire production of anthracite coal, excepting that consumed by employés and for steam and heating purposes about the mines:

| | November. | | Eleven months. | |
|---|---|---|---|---|
| | 1884. | 1883. | 1884. | 1883. |
| Phil. & Read ... | 1,159,606 | 1,242.399 | 10,282,172 | 11,477,484 |
| Lehigh Valley... | 592,316 | 623,843 | 5,429,984 | 5,849,307 |
| Del., Lac. & W.. | 509,750 | 489,769 | 4,727,986 | 4,708,419 |
| Del. & Hud. Can. Co.,..... | 310,466 | 378,634 | 3,067,506 | 3,288,977 |
| Penn. R.R..... | 267,444 | 268,838 | 2,927,172 | 2,557,625 |
| Penn. Coal Co... | 130,720 | 155,489 | 1,265,927 | 1,432,170 |
| N.Y., L. E. & W.. | 61,652 | 39,122 | 385,810 | 345,904 |
| Total..... | 3,031,954 | 3,198,094 | 28,087,557 | 29,659,883 |

New Jersey Central tonnage is included in the Philadelphia & Reading in both years. The Lehigh Valley tonnage includes that of the State Line & Sullivan road, 9,010 tons in November. Beside the tonnage given above there were 71,098 tons transported from mines by Delaware & Hudson Canal Co. during November which is included in tonnage of other interests.

The decrease for the month was 166,140 tons, or 5.2 per cent.; for the eleven months 1,572,329 tons, or 5.3 per cent. For the year the Lackawanna and the Erie show small gains and the Pennsylvania Railroad a large increase. The other companies all show decreases, that of the Reading being larger in proportion than is shown by any of the others.

The percentage of the total tonnage credited to each company for the eleven months is:

| | 1884. | 1883. | Inc. or Dec. |
|---|---|---|---|
| Philadelphia & Reading ..... | 36.6 | 38.7 | D. 2.1 |
| Lehigh Valley..... | 19.4 | 19.7 | D. 0.3 |
| Delaware, Lackawanna & Western.. | 16.8 | 15.9 | I. 0.9 |
| Delaware & Hudson Canal Co ..... | 10.9 | 11.1 | D. 0.2 |
| Pennsylvania Railroad..... | 10.4 | 8.6 | I. 1.8 |
| Pennsylvania Coal Co ..... | 4.5 | 4.8 | D. 0.3 |
| New York, Lake Erie & Western..... | 1.4 | 1.2 | I. 0.2 |
| Total..... | 100.0 | 100.0 | .... |

The stock of coal on hand at tidewater shipping points, Nov. 30, 1884, was 712,392 tons; on Oct. 31, 1884, 781,810 tons: decrease, 69,418 tons, or 8.9 per cent. during the month.

### Chicago-Ohio River Pool.

At a meeting in Indianapolis last week, after much discussion, the representatives of the different roads interested in this pool arrived at satisfactory settlements of the payments under the old pool.

They also formed a new pool extending from Nov. 1, 1884, to Dec. 31, 1885, under agreed per cents with some slight changes in territory. The meeting was a harmonious one.

All rates were ordered restored at once, Freight and Passenger Agents to meet immediately to arrange details and carry into effect the order of the Executive Committee.

At the meeting of the passenger agents in Cincinnati there was some trouble over the differential rate allowed the Chicago & Eastern Illinois heretofore, the other lines desiring to do away with it. This question may not be settled until another meeting.

### Transcontinental Traffic Association.

A dispatch from Chicago, Dec. 15, says: "The committee of members of the Transcontinental Association, which has been in session in New York for some days, arrived here yesterday and reported at a meeting of the association at the Grand Pacific Hotel this afternoon. The main subject under consideration is the adoption of a new tariff from seaboard to seaboard, to take effect Jan. 1, 1885. No conclusion was arrived at after a long session this afternoon, and there is every indication of a split in the association. The New York trunk lines refuse to accept the rates made here last week, unless the Transcontinental Association agrees on all business out of New York by all rail or by rail and water, by the Sunset route *via* Galveston and the Southern Pacific. This the Central Pacific refuses to do and a split seems inevitable. The meeting will probably continue throughout the week. About the only matter of importance outside of the consideration of rates is the appointment of a Commissioner to succeed Mr. Ristine, whose term expires with the present year."

On Dec. 16 the meeting was continued, the time being principally devoted to discussing the refusal of the Central Pacific to accept the schedule of percentages offered. The discussion resulted in no action, except the appointment of a committee to report on a readjustment of the divisions of traffic, this committee consisting of Messrs. Kimball, of the Union Pacific; Goddard, of the Santa Fe; Stubbs, of the Central Pacific; and Hannaford, of the Northern Pacific. The committee will report to an adjourned meeting.

At the third day's session, on Dec. 17, most of the session was devoted to a resolution by the Central Pacific that the members define their position in regard to the action of the seaboard trunk lines in refusing to concur in the new basis for rates to the Pacific Coast. The resolution was defeated. It was finally decided to instruct Commissioner Ristine to telegraph Commissioner Fink, suggesting a truce till Jan. 31 next. A majority of the association opposed a continuance of the subsidy of 6 per cent on San Francisco business to the Northern Pacific to prevent its competition. They also opposed a like subsidy to the Union Pacific for its Oregon Short Line to Portland. The Central Pacific offered a resolution that the Auditor be instructed to settle up the business of the association to Dec. 31, the meaning being that the association should go out of existence at that date. The resolution was carried unanimously.

### Southern Railway & Steamship Association.

At a meeting of the Executive Committee, held in New York, Nov. 26, the question of the division of territory between the Eastern and Western lines was put over for further consultation, to a meeting to be held after Jan. 1.

A motion for a reduction of cotton rates from Chattanooga was lost, and it was decided to send the question to the Board of Arbitration.

A form for a uniform north-bound bill of lading was adopted, to take effect Jan. 1 next.

The Rate Committee met on the following day, and, after disposing of much routine business, resolved, "that the Secretary prepare a set of rates from interior eastern points based upon all-rail rates or combination of locals (adopting the lowest) and submit same at next meeting, and that on such business in the meantime 70 per cent. of the rates from the ports *via* sea and rail lines and 80 per cent. of the revenue from Hagerstown and Alexandria *via* the Great Southern Dispatch or Virginia Midland line be pooled. Deposits to be made of 20 per cent. of the full port rate and 20 per cent. of the revenue from Hagerstown and Alexandria, and that if, after 90 days trial, any line object to this plan, that it then be revised by this Committee."

The General Commissioner was requested to instruct initial agents that way-bills must be carefully inspected and the rules of classification enforced; also that car-load rates must apply only to an entire car-load shipped to one consignee.

## OLD AND NEW ROADS.

**Arizona Mineral Belt.**—This company has concluded a contract for 8,000 tons of steel rails to be delivered next spring. The work of construction will be begun early next month. Contracts are to be let for the section of 95 miles extending from Flagstaff, Arizona, on the Atlantic & Pacific road, to Green Valley. It is stated that the company has made a traffic agreement with the Atlantic & Pacific road on very advantageous terms.

**Baltimore & Ohio.**—The Philadelphia *Ledger* says: "The Baltimore & Ohio Railroad has completed arrangements for a through line to New York *via* the Cumberland Valley and Harrisburg. We are informed by an officer of the Reading Railroad that there is very little new roadway to be built, and that it is the intention of the company to forward the construction of the new links without delay. The route of the new line will leave the main stem of the Baltimore & Ohio Railroad at Weverton, 79 miles from Baltimore, and will run thence over the Washington County Branch, 24 miles to Hagerstown; thence to Edgemont, 12 miles, over the Western Maryland Railroad. From Edgemont to Shippensburg, 34 miles, connection is made *via* the Baltimore & Cumberland Valley Branch of the Western Maryland with the Harrisburg & Potomac Railroad, which extends to Bowmansdale, 32 miles from Shippensburg. An extension of the latter road will be built to Whitehill, two miles from the west side of the Susquehanna River, where connection will be made with the new bridge of the South Pennsylvania Railroad (Vanderbilt's). On the eastern side of the Susquehanna another new branch, to be known as the Harrisburg & Western Railroad, less than a mile in length, will connect with the Lebanon Valley Branch of the Reading Railroad. From Harrisburg connection may be made with New York either *via* Reading, Allentown, Easton and the Jersey Central Railroad, 180 miles, or *via* Reading, Philadelphia and the Bound Brook route. The distance from Weverton to New York *via* the former route will be about 292 miles, or but 12 miles longer than *via* the Baltimore & Ohio main line from Weverton to Washington, Baltimore and Philadelphia, allowing the distance from Baltimore to Philadelphia as 98 miles, or a total distance of 280 miles. The new bridge over the Susquehanna near Harrisburg will be 3,600 ft. in length. The substructure of masonry—10 immense piers—is already completed, and the contract for the superstructure of iron has been awarded the Phœnix Bridge Co., the agreement requiring that it be finished by May next. This new route will enable the Baltimore & Ohio to make a direct connection from New York with Chicago, St. Louis and various other points through which its entire system extends in the Western states. The Reading Railroad will also obtain another important outlet for anthracite coal."

**Boston & Albany.**—A bearing has been in progress this week before the Massachusetts Supreme Court on the bill in equity brought by the Attorney General against this company to test the legality of the distribution to the stockholders of the stock bought from the state last year. The bill alleges that 24,115 shares of stock have been distributed to the stockholders under a vote of the corporation, a proceeding which was not legal or within the power of the company to do.

**Boston, Barre & Gardner.**—This company shows for the year ending Sept. 30 last: Gross earnings, $181,906; expenses, $155,439; net earnings, $26,467; interest, $40,387; deficit for the year, $13,920. Expenses include about $15,000 for improvements of the road.

**Boston & Lowell.**—It is stated that this company will build a branch of its leased Northern Railroad eastward from Franklin, N. H., to Tilton, on the Boston, Concord & Montreal road, a distance of four miles. In this case the through trains on the White Mountain Division will probably be run by way of the new line, avoiding the heavy grades between Concord and Tilton, and that section will be used only for local business.

**Buffalo, New York & Philadelphia.**—This company has made up its report for the New York Railroad Commission for the quarter ending Sept. 30. The figures are as follows: Gross earnings, $694,301; operating expenses, $446,306; net earnings, $247,995; income from other sources, $20,058; total net income, $268,753; interest on bonded debt maturing during quarter, $182,935; taxes, rentals, etc., $70,666; leaving a surplus for the quarter of $15,152.

This company on Dec. 17 issued a new circular asking the stockholders to subscribe $2.50 a share for the purpose of paying the floating debt. The circular says that the floating debt is about $1,500,000, which has been carried over for several months, but which must be paid on or before Feb. 1, 1885. The capital of the company is $50,000,000, and the proposed assessment of $2.50 a share will raise $1,000,000. The Union Terminal bonds, which the company owns, will be made available in settling the balance of the floating debt. The management proposes to give the stockholders, in return for their subscriptions of $2.50 a share, general mortgage bonds at par, and the stock on which this assessment is paid will be stamped "assenting stock" and quoted as such. The circular says:

"It is understood that the majority of the bondholders will assent to an equitable representation for assenting stockholders in any new company which may be formed, should there be any failure or foreclosure from any cause hereafter. The increase in value of stock will doubtless repay the subscription."

It is stated that a majority of the largest holders of the floating debt have agreed to accept the arrangements made.

**Central, of New Jersey.**—The directors of this company at a recent meeting discussed the question of selling certain assets of the company to pay off the floating debt, but finally decided not to sell them, on the ground that they were at present yielding too good a revenue, and that the money required could be raised more advantageously in some other way.

**Charlotte, Columbia & Augusta.**—At the recent annual meeting of this company representatives of the counties of Alexander and Iredell in North Carolina tendered to the company to the road-bed graded by those counties from Statesville, the terminus of this company's leased Atlantic, Tennessee & Ohio road, northwest 20 miles to Taylorville. The stockholders resolved to accept this road-bed and authorized the directors to make arrangements for laying the track thereon within the current fiscal year and it is expected that this road will be finished to Taylorville next summer. A further extension from Taylorville to Wilkesboro, 20 miles, is probable, as the people of Wilkes County have subscribed $50,000 to grade the road-bed.

**Cumberland Mountain.**—This company has filed articles of incorporation to build a railroad from a point on the north bank of the Cumberland River in Marion County, Tenn., to the mouth of the Little Sequatchie, and up that valley to the top of the Cumberland Mountains in Grundy County, a distance of about 24 miles. The company also intends to build a number of short branches, the object of the road being to develop what is known as the Cumberland Mountain coal field. The incorporators are John P. White, James McLaughlin, W. E. McNeilly, Percy Maddin, C. R. Handly and T. M. Steger.

**Cincinnati, Indianapolis, St. Louis & Chicago.**—This company's statements give the following figures for October and the four months of the fiscal year from July 1 to Oct. 31:

| | October. | | Four months. | |
|---|---|---|---|---|
| | 1884. | 1883. | 1884. | 1883. |
| Earnings..... | $241,145 | $249,507 | $945,764 | $936,032 |
| Expenses..... | 149,858 | 162,442 | 582,532 | 572,631 |
| Net earnings... | $91,287 | $87,065 | $363 232 | $363,401 |
| Fixed charges.... | 50,000 | 50,083 | 200,000 | 200,332 |
| Surplus..... | $41,287 | $36,982 | $163,232 | $163,069 |

For the four months the increase in gross earnings was $9,732, or 1.0 per cent.; the decrease in net earnings $169, and the increase in surplus $163, or 0 1 per cent.

The earnings above shown are from transportation only. Earnings derived from grain elevator, coal elevator, rents, and other miscellaneous sources, are credited at the end of each six months direct to profit and loss account.

**Des Moines Union.**—This company has been organized for the purpose of building a union depot in Des Moines, Ia., for the accomodation of the different lines entering that city which are controlled by the Wabash, and for the purpose of building connecting tracks between those lines and others entering the city.

**Forth Worth & Denver.**—The statement made at the annual meeting last week, for the year ending Oct. 31, shows gross earning of $482,162; operating expenses, $251,160; net earnings, $221,002. Adding surplus earnings Oct. 31, 1883, $89,584, makes the total net revenue $310,586. Deducting interest paid $161,035, leaves a surplus on Oct. 31, 1884, of $149,551. The earnings were $4,292 gross and $2,009 net per mile.

**Fremont, Elkhorn & Missouri Valley.**—This company has closed a contract with C. P. Treat of Chicago for the grading of 51 miles of road from Gordon, Neb., the end of the contracts heretofore let, to White River. This section is to be completed by July 15 next, and its terminus at White River will be within 60 miles of Rapid City in the Black Hills. This road is owned by the Chicago & Northwestern, although operated under a separate organization.

**Indiana, Alabama & Texas.**—Work is in progress on the section of this road from Clarksville, Tenn., north by west to Princeton, Ky., on the Chesapeake, Ohio & Southwestern road, about 55 miles. The grading is reported finished for 23 miles, and track laid for 10 miles from Clarksville, with work advancing steadily.

**Kalamazoo & Saginaw.**—At a railroad meeting in Hastings, Mich., recently, it was resolved to offer $42,500 in cash subscriptions and nearly all the right of way to any company which will complete the construction of this road from Kalamazoo, Mich., to Hastings, about 30 miles.

**Lackawanna & Pittsburgh.**—The appointment of the Receiver of this road noted last week was made on suit of the Attorney General of New York, the proceeding being made by him on application of A. J. Wellman, who is a creditor and bondholder of the company. The complaint alleges that the company is insolvent, and requests that the Court dissolve the corporation and order a final settlement of its affairs.

**Louisville & Nashville.**—It is understood that the subscription by the stockholders of this company to the recent loan have been satisfactory, that nearly all of the new stock insured has been taken, and also a considerable portion of the bonds.

**Louisville, New Orleans & Texas.**—This road, which has been opened for several weeks for freight and local passenger business, was opened for through passenger business Dec. 15. Two daily passenger trains will be run between Memphis and New Orleans. A through car service between Kansas City and New Orleans has been arranged in connection with the Kansas City, Springfield & Memphis road, and it is expected that through cars will before long be run between Louisville and New Orleans by this road and the Chesapeake, Ohio & Southwestern.

**Mexican Central.**—November earnings are reported at $275,300 on 1,236 miles of road. The mileage worked for this year has been 861 miles for two months, 964 miles for one month, 1,146 miles for one month, and 1,236 miles for the remaining seven months, being an average of 1,135 miles for 11 months. The total earnings to Nov. 30 were $2,658,934, or $2,343 per mile. The subsidy collected in November was $64,537, making a total of $2,961,168 up to the end of the month.

**Mexican Railroad Notes.**—The following notes are from the *Mexican Financier* of Dec. 6:

The Morelos Railroad has recently purchased eight locomotives in the United States weighing from 40 to 45 tons apiece, and the company expects to have them here in time for use at the beginning of the coming year.

General Manager Robinson, of the Mexican Central, after conference in Chicago with President Wade, who left this city last week to return to Boston, is expected to come to Mexico. His regular headquarters will be in El Paso in future.

A new joint through freight tariff has been adopted by the Mexican Central, the Atchison, Topeka & Santa Fé, the Galveston, Harrisburg & San Antonio, the Southern Pacific and the Texas & Pacific railroads, in connection with eastern lines. It gives rates to the City of Mexico from San Francisco, New York, Boston, Philadelphia, Baltimore, Pittsburgh, Cincinnati, Chicago, St. Louis, New Orleans, Galveston, Omaha, Kansas City and points common therewith.

**Monson.**—This company has filed a petition for authority to extend its road from Monson, Me., north through Shirley and Greenville to Moosehead Lake, about 16 miles; also from Monson Junction south to Skowhegan on the Maine Central road, a distance of 35 miles. The road is now in operation from Monson Junction to the quarries at Monson, a distance of 8 miles. It is of 2 ft. gauge.

**Mount Vernon, Coshocton & Wheeling.**—The proposition of this company to Ohio County, W. Va., has been accepted and that county will loan its credit to the company to the extent of $150,000. The proposed line of the road is from Wheeling northwest to Marion, O., the eastern terminus of the Chicago & Atlantic road, a distance of 156 miles. A large part of the road runs through a coal country, which, however, is already pretty well supplied with railroad facilities.

**New Hampshire Railroads.**—The annual report of the Railroad Commissioners of New Hampshire represents all the roads of the state in excellent condition. Nearly all the main lines have steel rails. The road-beds are well made and kept in good repair. The rolling stock is first class, and about the only criticism made is upon some of the stations. The total length of the railroads in the state is 1,042 miles. The capital stock is about $32,000,000, the bonded debt

about $9,000,000, and the floating debt $1,500,000, making about $34,000,000 in railroad property in New Hampshire. The gross earnings last year were $18,189,608, and the net income $5,098,691. The increase in the gross earnings the last six years has been nearly 40 per cent. Of the 35 corporations making reports, 24 paid dividends last year amounting to $1,842,217. Three roads paid 10 per cent., two 8, three 7, one 6½, nine 6, and the others less. There was no increase of mileage last year, and in the opinion of the Commissioners none is needed except an extension of the Boston, Concord & Montreal from Groveton to Colebrook. They argue that competing roads are not necessarily a benefit to any place, and approve the policy which is consolidating all the roads of the state into three or four distinct systems.

**New Jersey Railroad Taxation.**—The New Jersey Central, the Delaware, Lackawanna & Western and several other companies having filed appeals from the valuation of their property made by the State Commissioners of Railroad Taxation, a hearing has been in progress in Trenton this week which promises to continue for some time. The State Commissioners largely increased the valuation put upon the properties of the several companies.

**New York, Chicago & St. Louis.**—This company's statement to the New York Railroad Commission for the year ending Sept. 30 shows that the gross earnings were $3,196,476; operating expenses and taxes, $2,222,213, leaving net earnings of $974,263. The dividends on investments were $41,289, making the total income $1,015,552. The rentals paid were $26,888; interest on debt, $1,329,105, making the total payments $1,355,993. The deficit for the year was $340,441.

**New York, Lake Erie & Western.**—A Port Jervis (N. Y.) dispatch says: "By a new order, which took effect on Dec. 15, the running of through passenger trains on the New York, Lake Erie & Western Railroad will be subjected to a radical change. As now operated, one gang of trainmen has charge of each of these trains between Jersey City and Port Jervis, a distance of 89 miles. At Port Jervis fresh gangs take the trains, some of them running to Owego and some to Elmira. The new order will compel men starting with the day express, the St. Louis limited and the Chicago express to run from Jersey City to Binghamton, 215 miles, and from Binghamton to Jersey City on corresponding eastbound trains. The gang now running the Pacific express between Jersey City and Port Jervis, and the Atlantic express from Port Jervis to Jersey City, will remain in charge of these trains between Jersey City and Elmira, a continuous run of 10 hours.

"One effect of this new order of things will be the removal of four gangs of passenger trainmen from the Eastern and Delaware divisions—engineers, firemen, conductors and brakemen. This one change will make a reduction in the cost of the train passenger service of the road of nearly $22,000 a year. The gangs retained for the new service will be made up from the oldest and most competent of the employés and under the old system. The change will also necessitate the breaking up of the homes of many old employés, some of whom have invested the savings of more than a quarter of a century in residences in this village."

The company's statement for October, the first month of the fiscal year, is as follows, including 68 per cent. of the earnings and the entire working expenses of the leased New York, Pennsylvania & Ohio Railroad:

| | 1884. | 1883. | Decrease. | P. c. |
|---|---|---|---|---|
| Earnings | $1,867,857 | $2,411,146 | $543,289 | 22.5 |
| Expenses | 1,240,015 | 1,567,778 | 237,763 | 15.2 |
| Net earn | $627.842 | $843,368 | $215,526 | 25.8 |

The following statement gives the earnings of the Erie lines proper, excluding all earnings and expenses of the New York, Pennsylvania & Ohio:

| | 1884. | 1883. | Decrease. | P.c. |
|---|---|---|---|---|
| Earnings | $1,511.158 | $1,983,467 | $472,309 | 23.8 |
| Expenses | 932,497 | 1,196 344 | 263,847 | 22.1 |
| Net earnings | $578,661 | $787,123 | $208,462 | 26.5 |

A comparison of these statements shows that the 68 per cent. of the gross earnings of the leased road was this year $356,699, while the expenses were $307,518, showing a profit of $49,181 on the lease for the month, against a similar profit of $56,245 for the month last year.

**New York Providence & Boston.**—At the annual meeting in Providence last week, a resolution was passed approving of the action of the directors in leasing the Pawtucket Valley Railroad and authorizing them to lease or purchase the Pontiac Branch upon the best terms possible. President Babcock stated that no decisive arrangements had been completed with regard to the building of the Thames River bridge as yet.

**New York, West Shore & Buffalo.**—The report of the Receivers for the four months from the date of their appointment, June 1, to Sept. 30, gives the following balance sheet:

*Liabilities.*

| | |
|---|---|
| Capital stock (common) | $40,000,000 |
| Funded debt | 70,000,000 |
| Loans and bills payable | 462,765 |
| Interest on funded debt due and accrued | 2,253,570 |
| Due for wages, supplies, etc | 1,812,706 |
| Sundries | 4,811,090 |
| Total | $119,339,632 |

*Assets.*

| | |
|---|---|
| Cost of road and equipments | $99,027,121 |
| Stocks and bonds of other companies | 864,441 |
| Other permanent investments | 991,510 |
| Supplies on hand | 497,843 |
| Cash on hand | 339,354 |
| Sundries | 17,619,332 |
| Total | $119,339,632 |

The sundry assets include $10,000,000 income bonds, which are also included in the liabilities as funded debt. The operations of the road for the four months were: Gross earnings, $1,297,984; operating expenses, $1,213,720; net earnings from operation, $84,264; operating cost, 93 per cent. of earnings; income from other sources, $3,072; net income from all sources, $87,337; deductions from income (interest $20,955, taxes $33,113, rents paid $13,121), $67,189; net surplus, $20,148.

**Norfolk & Virginia Beach.**—The creditors of this company have filed a bill asking for the appointment of a receiver. The road extends from Norfolk eastward to Virginia Beach on the Atlantic below Cape Henry, and the company also owns a large hotel at the terminus.

**Ohio & Mississippi.**—It is announced that the interests of the English stock and bondholders and of the Baltimore & Ohio in this company have finally been amicably adjusted, in accordance with the agreement made at Baltimore a short time ago. The English stockholders receive two additional directors in the board and are also given a representation on the Executive Committee. Nothing further has been announced in relation to the proposed lease of the road to the Baltimore & Ohio, but it is supposed that negotiations are still in progress.

**Ohio River & Lake Erie.**—This company, which has begun the construction of a railroad on the line of the old canal from Sharpsville, Pa., to Erie, has executed and filed for record a mortgage to secure an issue of $1,500,000 in bonds.

**Old Colony.**—This company having petitioned the Massachusetts Railroad Commissioners for a decision under the exigency law, the board, after a public hearing, has decided that public convenience and necessity require the construction of a branch or extension of that road in the city of Boston and the towns of Milton and Quincy, between the Shawmut and the Dorchester & Milton branches and the Granite branch.

**Pittsburgh, Fort Wayne & Chicago.**—In accordance with the agreement under which the suit with the Pennsylvania Railroad Co. was settled, this company has applied to the New York Stock Exchange to list the further issue of its guaranteed special stock, amounting to $1,226,555, which is the amount claimed by the Pennsylvania Co. The amount heretofore issued is $8,400,000, the last having been issued in June, 1882.

**Port Jervis & Monticello.**—Application was made to the Supreme Court Dec. 13, for the appointment of a receiver for this road by a creditor, who is understood to act in concurrence with the officers of the company. The road extends from Port Jervis, N. Y., to Monticello, 24 miles. The present company, which was organized in 1875 by bond holders who bought the road at foreclosure sale, has $31,000 funded debt and $724,275 stock. The floating debt is said to be of considerable amount.

**Portland & Ogdensburg.**—The Receiver reports that steel rails have now been laid on the entire road, with the exception of a few short gaps, where the work will soon be finished. The high wooden trestle at Conway has been replaced by an iron viaduct, and much work has been done on the bridges at other points. A new passenger locomotive has been bought and two heavy freight engines ordered. The Receiver hopes before long to report the entire property in good condition.

**Providence & Springfield.**—At the annual meeting last week the reports showed that the stock of this company is now $517,150; the total funded and floating debt is $503,000. For the year ending Sept. 30 last the road carried 1,126,805 passengers and 47,272 tons of freight. The gross earnings were $93,241, or $4,662 per mile; the expenses were $74,342 (79.7 per cent.), and the net earnings $18,899, or $945 per mile.

**Rochester & Pittsburgh.**—The following circular from the second-mortgage bondholders' committee (Messrs Adrian Iselin, George W. Parsons, Walston H. Brown and Adrian Iselin, Jr.) is dated New York, Dec. 12:

"Since the failure of the scheme for reorganizing your Company under the agreement of Oct. 15, 1884, owing to the requisite amount of preferred stock not having been subscribed for, the parties holding second-mortgage bonds, as collateral security for the loans they had made the company, proposed to purchase these bonds for the amount due to them, and agreed, when they would become owners of them, to sign an agreement, the substance of which we give below, and also subscribe $500,000, unconditionally, to the stock, which is to be sold according to the terms of this agreement.

"Your directors have thought it for the interest of the stockholders to accept this proposition, and have sold $1,359,000 second mortgage bonds, with August coupons on, for $698,236, this being the amount of the loans, with interest to Dec. 12, which they secured.

The following is the substance of the agreement: The new company to have a capital of $5,000,000 common stock; $4,000,000 first-preferred stock; $3,000,000 second-preferred stock. Both the first and second-preferred stock to be entitled to 6 per cent. dividend per annum, when earned and non-cumulative. The $5,000 common stock to be exchanged for the present Rochester & Pittsburgh Railroad Co. stock, one share for four. Any excess of net earnings over 6 per cent. on both preferred and common stock to be divided *pro rata* between the different classes of stock.

"So much of the first-preferred stock as is necessary shall be exchanged at par for all second-mortgage bonds and floating debt which have come under this agreement with accrued interest to the time of the filing of the certificate of the organization of the new company. There shall be distributed to the second-mortgage bondholders and floating-debt creditors, who shall have come under this agreement, a bonus of 33⅓ per cent of the amount of first-preferred stock, to which they shall be entitled of the second-preferred stock. The balance of the first-preferred and second-preferred stock to be offered for sale in blocks of one share of first-preferred stock and two shares of second-preferred stock for $100. Books of subscription will be opened at the office of Walston H. Brown & Bros., 20 Nassau street, New York, Dec. 12, and will close at 3 p. m. Dec. 31.

"This agreement has been signed by the purchasers of the $1,359,000 second-mortgage bonds above mentioned. They have also subscribed $500,000 to the first and second-preferred stocks offered for sale, according to the terms of the agreement. Additional signatures to the agreement have been made by the holders of $986,000 second-mortgage bonds and $269,000 floating debt.

"There is, therefore, no doubt but that the new company will be organized on the basis of this agreement as soon as the foreclosure proceedings on the second-mortgage can be brought to a successful issue. It is for the interest of the stockholders that this should be done with as little delay as possible, for until then the present obligatory interest in excess of the net earnings of the road will be accruing against them. These net earnings are at present only nominally in excess of the interest on the first-mortgage and car-trust bonds, so that the interest on the second-mortgage bonds and floating debt, amounting to about $196,000 per annum, will accumulate against the company until the road has been sold and the new company organized. This interest will have to be funded into first and second-preferred stock, and will diminish to the extent to which it is funded the available amount of first and second-preferred stock to be sold."

**St. Louis, Fort Scott & Wichita.**—On the extension of this road track is now laid to Springdale, Kan., 14 miles southwest from the late terminus at Clearwater and 35 miles from Wichita. Grading is well advanced toward Anthony in Harper County, some 20 miles further.

**Securities on the New York Stock Exchange.**—The Governing Committee of the New York Stock Exchange has placed the following securities on the list:

*Chicago & Northwestern*, $1,600,000 first-mortgage bonds issued on the new Ottumwa, Cedar Falls & St. Paul branch.

*Chicago, St. Paul, Minneapolis & Omaha*, 13,826 shares of common and 20,739 shares of preferred stock, issued on 138¼ miles of new road. This makes the total of common stock listed $13,283,500, and of preferred stock, $22,087,700.

*Louisville & Nashville*, $1,360,000 of new 6 per cent. adjustment bonds.

**Talladega & Coosa Valley.**—Track is now laid on this road to Moxley, Ala., 12 miles northward from the starting point at Talladega. Grading is in progress on a section of 6 miles from Moxley to the Coosa River.

**Texas & Pacific.**—The bondholders' committee has addressed a letter to the bondholders setting forth the result of the negotiations. The agreement arrived at is stated in the shape of a memorandum in a letter by Mr. Wright to Jay Gould, and its principal features are as follows: The recommendation is that the present funding plan be modified as to the Middle Division, giving the bondholders who do not wish to fund their coupons payment of the same in cash, the company using the terminal bonds as collateral for money borrowed for this purpose, and also to pay the Missouri Pacific for the past due coupons of the consolidated bonds paid by that company in June last. These last coupons, as well as all the coupons on the same (consolidated) mortgage, are to be deposited with the trustee of the new (terminal) mortgage to be held by the Trustee for the sole purpose of protecting the company (as they constitute a prior lien) against any possible action that may be taken by the income and land-grant bondholders in the several suits now pending, or in others that may be instituted, against the Texas & Pacific Railway Co. All other indebtedness is to be extinguished in the same manner.

The funding plan as to the bonds on the Rio Grande and New Orleans Division mortgages is to be carried out, but the coupons are to be funded one by one as they mature, so as not to impair the bonds, and the coupons shall not be kept alive after they are funded, and will not be held by the Trustee of the terminal bonds as security for the terminal bonds which may be exchanged for them. This shall also apply to the coupons which may be paid with proceeds of terminal bonds. The terminal mortgage shall be modified by a supplemental mortgage or other instrument, so as to make effective the foregoing provisions. Such papers shall also be executed as will relieve the bonds already stamped from the effects of such stamping and place all the bonds on the same footing in the market.

At the next annual meeting of stockholders it is proposed that the following-named gentlemen be elected directors of the company: John A. Wright, John Markoe, James P. Scott, Charles O. Baird, John C. Bullit, Isaac J. Wistar, J. N. Hutchinson, William D. Winsor, Jay Gould, R. S. Hayes, Russell Sage, T. T. Eckert, George J. Gould, E. L. Ames, A. L. Hopkins, John C. Brown and G. B. Roberts, it being mutually understood that in the event of disability or failure from any cause of any of these gentlemen to accept or serve, the vacancy so created shall be filled by the committee, or Mr. Jay Gould, or both, as may be necessary to maintain the constitution of the board of directors as agreed, vacancies now existing and such as may arise between now and the annual election to be filled as the application of the same rule may require. The new members to be introduced into the board shall begin by the selection of Mr. John A. Wright and Mr. Isaac J. Wistar, and they, with such others as can conveniently be brought into the board, are to be elected when and as it may be found convenient to do so by the filling of vacancies now existing or that may be made by resignations of the present members of the board.

The committee recommend the adoption of the plan by the bondholders, and that they send in their coupons as they mature and fund them, according to the terms of the circular of July 20, 1884, as modified by these arrangements.

**Union Pacific.**—The land-sales for the eleven months this year to Nov. 30 were: Union Division, 4,207,839 acres for $6,430,865; Kansas Division, 446,664 acres for $1,873,792; total, 4,654,503 acres for $8,304,657. The total sales for the corresponding period last year were 989,267 acres for $3,490,975. The sales this year have been at a lower average price; they included several very large tracts of grazing lands.

**Wabash, St. Louis & Pacific.**—The Receivers of this road have filed their report with the Court for the quarter ending Nov. 30. During this quarter additional receivers' certificates were issued to the amount of $30,000. Nearly all the notes given for equipment by the company have now been taken up by the Receivers, leaving but a small amount due on this account outside of the indebtedness to the New York & Pacific car trust, which is payable in regular installments. The total receipts for the quarter, including a balance of $37,889 on hand, were $7,090,247. The total disbursements were $7,137,802, leaving an overdraft of $47,555. Payments made on the interest accruing during the quarter amounted to $759,935, which is included in the above statement.

The following statement is made for September and the nine months ending Sept. 30:

| | September. | | Nine months. | |
|---|---|---|---|---|
| | 1884. | 1883. | 1884. | 1883. |
| Earnings | $1,721.230 | $1,737,182 | $12,109.987 | $12.117.226 |
| Expenses | 1,290,500 | 1,127,589 | 10,040,777 | 9 838,728 |
| Net earnings | 430,930 | $609.593 | $2,069,210 | $2,278,498 |
| Per cent. of exps. | 75.0 | 64.9 | 82.9 | 81.2 |

For the nine months the gross earnings decreased $7,239, or 0.1 per cent., and the expenses increased $202,049, or 2.1 per cent., the result being a decrease of $209,288, or 9.2 per cent., in net earnings. The interest payments under court orders for 1884 will be $2,733,777; taxes, $532,159; car trusts, $212,710; rentals, $248,903; total, $3,727,549. If net earnings for the last three months average the same as for the nine months, the total net will be for the year about $2,759,000, or about $568,500 less than the requirements.

**Waynesburg & Washington.**—It is proposed to extend this road from Waynesburg, Pa., southward to Blackville, W. Va., about 30 miles. A line from Washington, Pa., west to Wellsburg, W. Va., on the Ohio River is also proposed.

**Wilmington & Fayetteville.**—A survey has been completed for a railroad from Wilmington, N. C., up the east side of the Cape Fear River to Fayetteville. The estimated cost of the road is only about $4,500 per mile, the country being level and the work very light. The distance is about 85 miles.

**Wilmington & New River.**—It is proposed to build a railroad from Wilmington, N. C., eastward to Sneed's Ferry, on the New River, in Onslow County, about 40 miles. The estimated cost of the road is only about $175,000, and it is expected that it will bring considerable local business to Wilmington.

**Wisconsin Central.**—No agreement has been reached with the Chicago, Milwaukee & St. Paul Co. with regard to the use of its tracks for through St. Paul business under the existing contract. The Wisconsin Central people say that they will prepare at once to extend their road from Schleisingerville into Milwaukee and from there to Chicago. Probably they do not wish or expect to build so much new road, but think that the threat may prove effective.

**Wisconsin, Pittsville & Superior.**—This company offers to extend its road from Vesper, Wis., to Marshfield, 20 miles, provided Marshfield will give $40,000 in bonds, depot grounds and right of way into the town.